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amateur radio





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**American Radio
Relay League**

West Hartford, Connecticut



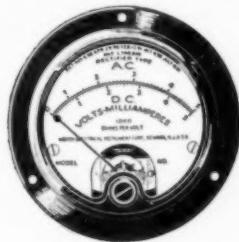
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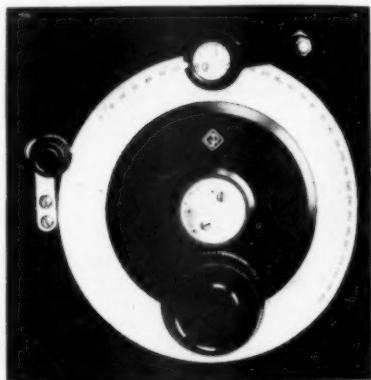
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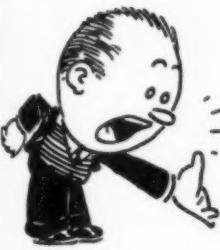
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INSTRUMENTS OF PRECISION AND DEPENDABILITY

QST

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Editorials	7
WMAQ Broadcasts Again	8
Armistice Day Message	8
U.S.A.-Ireland 'Phone Reception	8
Building a Crystal-Controlled Transmitter	George Grammer 9
An All-Wave Midget Receiver	R. B. Parmenter 14
Efficiency in the Output Amplifier	Fred H. Schnell, W9UZ 17
Audio Selectivity — Alias Tone Control	Alton H. Gould, WICFO 21
Keeping the Feeders Taut	21
A Sure-Fire Condenser Microphone	Howard F. Anderson, W1BVS 22
A Lesson from the Commercials	Don H. Mix, WITS 25
Running Down Local QRM	Robert B. Witschen, W9SV 27
Standard Frequency Transmissions	28
The Single-Signal Receiver at Work	29
Third All-Section Sweepstakes Contest	F. E. Handy 33
Some Ideas About Band-Spreading	36
For the Experimenter	
A TRANSMITTER WITH UNUSUAL FEATURES — CUTTING OUT TUNABLE HUMS — ELECTRONIC 'PHONE BREAK-IN — AN- OTHER 'PHONE BREAK-IN SYSTEM — CURING INTERFERENCE WITH TELEPHONE LINES — AN ADAPTER FOR THE SE-143	38
W8XK in New Location	41
Amateur Radio Stations	W9DCX, W5FB, K7ANQ 42
Simple Time-Lag Device	43
Calls Heard	44
I. A. R. U. News	45
Silent Keys	47
Communications Department	48
Correspondence Department	66
Summer Activities	72
The Hudson Division Convention (Report)	78
The Midwest Division Convention (Report)	80
Hamads and QRAs	92
QST's Index of Advertisers	94

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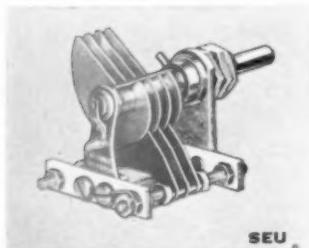
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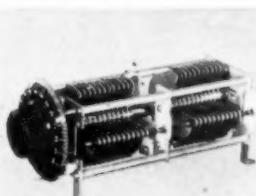
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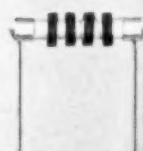
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• THE AMERICAN RADIO RELAY LEAGUE, INC.

RELAY LEAGUE, INC., is a non-commercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is non-commercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the world and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite. Correspondence should be addressed to the Secretary.

A directory of the amateur societies affiliated with the League, showing their times and places of meetings, is available upon request.

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Address all general correspondence to the executive headquarters at West Hartford, Connecticut

THE EDITOR'S MILL

WRITING in late September we find that the Madrid international radio conference has made considerable progress in the three weeks it had then been in session.

Madrid As was expected, the first week was occupied principally in the lining up of the various committees, with additional delay in the settlement of diplomatic questions of voting and official language. Gradually, however, the decks seem to have been cleared for action and while much of the time up to the last of September was occupied in a big fight on long-wave broadcasting — the principal problem of the conference, apparently — there was progress on amateur matters.

Summarized, it would appear that the general amateur regulations have been adopted almost identically as they exist at present in the Washington convention of 1927. Our amateur representatives were successful in defeating an attempt to foist the so-called Hague regional agreement on us. Those who are interested in knowing just what it would have meant to have such a set of conditions under which to operate are referred to page 24 of *QST* for December, 1929, where the Hague agreement is set forth in detail. So far, then, each nation will continue to be free to specify its own amateur power limits, operator qualifications, etc., which is, of course, just what we in America want.

Another much-desired step in the right direction was the acceptance by the conference committee of our view that amateur stations and experimental stations are two different kinds of animal and should not be classed together. However, a special definitions committee will have another whack at this later, so more battle may materialize on the point before the conference is over. On the message-traffic question only the United States and Honduras backed our representations for the liberalizing of international message handling; it seems likely that the treatment given this question in the Washington convention will be repeated in the Madrid document. None of this, of course, affects our American domestic message traffic.

Now, so far practically everything seems to be a continuation of the terms of the Washington agreement, and this might lead to the supposition that the same ideas will prevail right through the conference. We warn our members against any such assumption. Amateurs seem to be assured of fair and satisfactory operating privileges and regulations, to be sure, but operating privileges don't do us much good if we don't have the

territory in which to operate. And we trust that by this time it will be noticed that nothing has been done yet on frequency allocations. Aye, there's the rub!

Conjecture has no place in this treatment, which is properly only a report on progress. Up to press time for this issue nothing had been done on high-frequency allocations, although it is expected that the high-frequency allocation table will come up for discussion during the early part of October. There can be no doubt, however, that a lively battle will be waged. Already a strong attack has been generated by a group of European nations on our 1715-ke. band. While KBW cables us assurances that the preservation of this band seems certain for us North American amateurs, the move, if regarded as a forecast, indicates additional hostility toward our other territory.

In conclusion, we suggest that members interested in a "blow-by-blow" account of the conference fight tune in on the official A.R.R.L. broadcasts which are made up each week from data cabled by Secretary Warner on the happenings of the previous week.

WITH the exception of the temporary amateur ticket, which continues to have a one-year term,

Three-Year Licenses all classes of radio operator licenses will now be issued for a three-year term as the result of instructions sent out to supervisors by the Federal Radio Commission recently. We hasten to point out that this applies to operator licenses only; our station licenses continue on a one-year basis. However, there is some hope that our desire for an extension of the station-license period may soon come about, too. On September 30th, Commissioner Lafount introduced a resolution — as yet not acted upon — looking to the extension of the term of amateur station licenses to three years, commercial to two years, and broadcast to one year.

At the same time it issued the three-year operator license order, the commission washed out the old license form. Gone, apparently, are the days of the impressive certificates which have been so familiar to us through all these years. The new operator licenses are prosaic printed documents similar to the present station license. Progress, we suppose, and undoubtedly a saving to the government — but those old tickets were grand decoration for the wall of our operating room!

AGAIN, as November rolls up on the calendar, members of the League in seven of our divisions will be given their constitutional *Elections* opportunity to select the man of their choice to represent them for the next two years on the League's board of directors. As has been customary now for some years, we take time out for a moment to call attention to the elections and to urge every member to exercise his voting right.

Our League, as has often been pointed out on this page, is a democratic organization. The thing that is at once the strength and the weakness of such a form of government is that the voting power resides in the individual. An intelligent voting membership can make a democracy the nearest approach to ideal government man has been able to devise; conversely, a democracy becomes a sorry spectacle when members either fail to vote or vote carelessly. An inactive director, who doesn't answer correspondence, doesn't maintain contact with his constituents or exhibits a lack of the ability we must have on our board, is principally a reflection on the poor judgment of those who elected him.

Electing your director is 100% up to you, the individual member. The board, the officers, headquarters — none of these can lift a finger to do it for you. It's your job. When you receive your ballot, *vote* — and don't forget to mix in headwork while you're about it.

A. L. B.

WMAQ Broadcasts for Hams Again

THE popular "Ninth District Radio Amateur" program conducted by Forrest P. Wallace over WMAQ last spring is being resumed October 15th, a piece of good news to the amateurs all through the Middle West who followed this program avidly during the weeks it was put on last season. Every Saturday afternoon, from 5:15 to 5:30 p.m., C.S.T., the WMAQ broadcast will come over on its 670 kc. frequency.

Wallace, W9CRT, N.B.C. announcer, reminds us that correspondence from fellow amateurs is welcomed, as well as club papers from both the eighth and ninth districts. This material is very valuable in making up the weekly broadcasts, and serves as a medium of giving all clubs and amateurs a "break."

Armistice Day Message

ZLVA v WLM, W3CXM and W3CXL on November 7th

THE annual Armistice Day message from the Chief Signal Officer to Army Amateurs will be broadcast from WLM on 6990 kc., W3CXM on 3548 kc. and W3CXL on 3605 kc. on Monday night, November 7th. The message will be broadcast every hour, on the hour, from WLMA and on the half hour from WLM and W3CXL (keyed simultaneously). This will continue from 6:00

p.m. until 2:00 a.m. Thursday (E.S.T.). It also will be broadcast from all Net Control Stations.

All Army Amateur stations should copy the message from either: (a) one of the two Army Net Control Stations or (b) from their own Corps Area Net Control Station.

All stations copying the message should mail their copy direct to the Chief Signal Officer, Munitions Building, Washington, D. C. The message should show the operator's name and station call, the hour received and from what station received.

All Amateurs, whether members of the Army Amateur Radio System or not, will have their calls listed on the Army honor roll, and also in *QST*, if they copy and mail in the received message.

U.S.A.-Ireland 'Phone Reception

LOCAL high-powered W1DTJ after receiving reports on 3900-kc. W 'phones in Matthew Sheridan, Wilkinstown, Navan County, Meath, Ireland, decided that a test would be interesting. Accordingly, a letter was dispatched to Sheridan and in the meantime W1DTJ passed the word along the Atlantic Seaboard of the forthcoming test and interest was intense among the 'phone brethren. The night of the test came and the W stations sent their calls broadcast on scheduled time, nothing else to do but sit and hope reception was good in Ireland. Two weeks later the report was received by W1DTJ and the successful stations getting across were: W1AVG, W1AVK, W1BNR, W1DTJ, W2CE, W2CMH, W2DOK, W2GO, W2LI, W3ALZ, W3AQR, W3SM and VE1AX. Many stations were received besides these but because they came through three and four deep it was impossible for Sheridan to distinguish the calls. Mr. Sheridan's log shows in addition these calls heard at previous dates: VE1AJ, VE1DA, W1AHM, W1BES, W1BIC, W1CZS, W2AMB, W2AMH, W2CGY, W2DKA, W2IH, W3AMB, W3BLZ and W8AHF. Looks as though the time was ripe for some transatlantic 'phone schedules.

Strays

W8EXI says that W9FBC is right about moonlight nights being better for YL's than DX, because he visited seventeen hams in the Bronx one summer night and found only one at home — and that one was just getting ready to do some stepping out!

The town of Ocean Grove, N. J., is one of those blue-law communities in which automobiles are prohibited on Sundays. On those days there is perfect high-frequency reception, especially on 14 mc. and higher, says W2BYK!

Building a Crystal-Controlled Transmitter

An Inexpensive Outfit Which Any Beginner Can Make

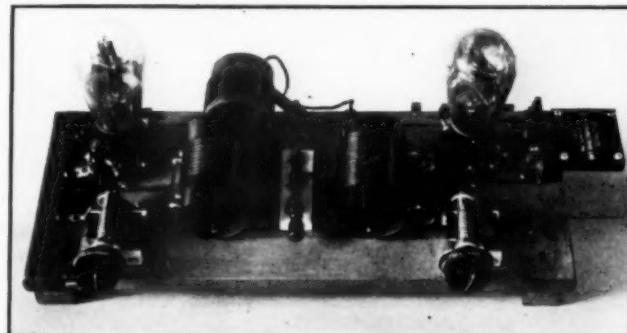
By George Grammer, Assistant Technical Editor

BEGINNERS — and a large number of amateurs who are not beginners — frequently fight shy of crystal control because it looks complicated and expensive. Yet transmitters of this type need not be costly or hard to build. A crystal oscillator is, in fact, simpler than a self-controlled oscillator in mechanical construction, largely because the attention to small details that is such an important factor in the design of a good self-controlled oscillator becomes a relatively minor consideration. For example, a self-controlled oscillator must have a high-C circuit with its attendant demand for a high-capacity tuning condenser and an inductance of low resistance to reduce losses; it must be protected against vibration and mechanical shocks if the good effects of proper electrical design are not to be nullified; coupling the antenna and tuning it to the oscillator are arts in themselves if the built-in stability of the oscillator is to be preserved under working conditions; circuit adjustments must be carefully made; precautions must be taken to make certain that the transmitter is not radiating off frequency.

Contrast this with the crystal oscillator, in which stability is an inherent property of the quartz crystal used, and is only to a small extent dependent upon the circuit design and adjustment. Tuning condensers can be small affairs — midget condensers of low maximum capacity are entirely satisfactory — and inductances can be wound of comparatively small wire because the tank currents are lower than in high-C circuits. Antenna coupling and tuning have lessened effect on the frequency and stability of the oscillator. Such circuit adjustments as have to be made are chiefly those having to do with power output, and have relatively little effect on the quality of the output. Aside from the crystal itself, the cost of the parts required for a crystal oscillator is likely to be less than that of those for a self-controlled oscillator of equal power rating. The price of the crystal can be considered to be insurance — insurance against being off frequency and against putting out an "outlaw" signal.

THE SIMPLEST CRYSTAL TRANSMITTER

No doubt one of the things that discourages beginners from using crystal control right at the outset of their amateur careers is the fact that even the simplest low-power sets seem to be two or three-tube affairs. They have at least one amplifier in addition to an oscillator, and amplifiers must be neutralized — a difficult-looking proposition — to say nothing of the extra tuning adjustments required by amplifiers. But it is *not* necessary to have an amplifier with a crystal oscillator. The oscillator can be coupled right to the antenna just as can any self-controlled oscillator, and it can be keyed at ordinary rates of speed just as



OSCILLATOR AND DOUBLER

This breadboard set, a low-power transmitter for two bands, uses a '47 crystal oscillator and a '46 doubler.

well as can the self-controlled oscillator, provided one has a reasonably active crystal. The power output will be just about the same as that from a high-C self-controlled oscillator at the same plate voltage.

An oscillator of this sort can be made quite simply, requiring only a coil and condenser which together will tune to the frequency of the crystal, a crystal and holder, a by-pass condenser and r.f. choke, and a few small resistors. Since the chief requirement is to get as much power as possible from the oscillator without danger to the crystal, the oscillator tube should be a Type '47 pentode, which is one of the best performers in this respect. Nothing complicated about the wiring diagram, which is the right-hand half of Fig. 1, nor about the sample layout shown in the photograph. In this photo the oscillator occupies the right-hand half of the board, the left-hand

half being reserved for a doubler which makes two-band operation possible. This outfit, in conjunction with another unit which will be described in a coming issue of *QST*, forms a complete crystal transmitter for low-power three-band operation. To start out, however, only the oscillator need be built. The doubler can be added later, but room might as well be left on the board for it.

The socket for the '47 is placed at the rear edge of the baseboard, which measures 6×16 inches, near the right-hand edge, and just to its right is a socket mounting for the plug-in crystal

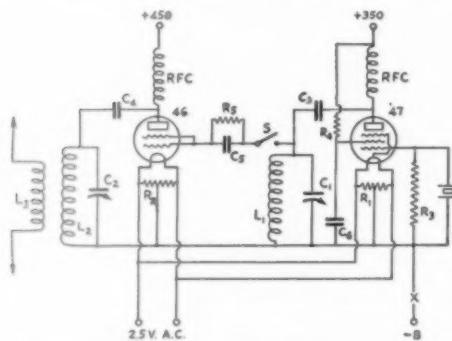


FIG. 1 — THE TRANSMITTER CIRCUIT

C₁ — Oscillator tuning condenser; 140- μfd . midget condenser, Hammarlund.
 C₂ — Doubler tuning condenser; same as C₁.
 C₃ — Oscillator plate blocking condenser; 500- μfd . mica condenser.
 C₄ — Doubler plate blocking condenser; same as C₃.
 C₅ — Coupling condenser; 100- μfd . mica condenser.
 C₆ — Screen by-pass condenser; .001- μfd . mica condenser.
 R₁, R₂ — Filament center-tap resistors; 20 ohms, center tapped.
 R₃ — Oscillator grid leak; 5000 ohms, 5 watt.
 R₄ — Screen dropping resistor; 50,000 ohms, 5 watt.
 R₅ — Doubler grid leak; 20,000 ohms, 2 watt.
 L₁ — Oscillator tank coil; 21 turns of No. 14 enamelled wire on 2" bakelite tube, spaced with string between turns to occupy 2 inches.
 L₂ — Buffer tank coil; 11 turns same construction as L₁ but spaced to occupy 1½ inches.
 L₃ — Antenna coupling coil; 13 turns No. 14 enamelled wire, close-wound on 2" bakelite tube.
 S — Single-pole switch.
 X — Key. See text for other keying positions.

holder. The filament center-tap resistor, R_1 , is just behind the tube socket. The oscillator tuning condenser, C_1 , is mounted at the front edge of the board, the plate blocking condenser, C_3 , being fastened to the board between C_1 and the tube socket. The oscillator inductance, L_1 , is at the left. These are the only oscillator parts mounted on top. Underneath are the r.f. choke, the grid leak, R_3 , the dropping resistor for the '47 screen voltage, R_4 , and the screen by-pass condenser, C_6 . These are placed where it is most convenient to meet the connections coming through from the upper side of the baseboard, and their relation to each other has no particular significance. The filament and plate connections from the power supply are brought in through Fahnestock clips

fastened to the rear edge of the board. The $L_1 C_1$ circuit is designed to cover the 3500-kc. band, and therefore will work with a crystal cut for any frequency in that band.

THE 7000-KC. DOUBLER

Although the doubler part of the set may be omitted if operation on only the 3500-kc. band is wanted at first, it is just as well to describe its construction at this point. The doubler is nothing more than an amplifier which has its plate circuit tuned to the second harmonic of the oscillator frequency; in other words, the output of the doubler is on a frequency just twice that of the crystal oscillator. Output on this frequency is possible because the doubler is a *distorting* amplifier; the greater the distortion it introduces the greater is the harmonic output. This, it will be observed, is just the opposite of what is intended with audio amplifiers.

Since the output circuit of the doubler is tuned to twice the frequency supplied to its input circuit, the doubler cannot itself oscillate and consequently does not need to be neutralized. It is therefore no more difficult to hook up than an audio amplifier would be. Maximum harmonic output will be obtained when the doubling tube has a high amplification factor and is operated with large negative bias and a strong input signal. The Type 46 tube has a high amplification factor and is therefore a good tube to use as a doubler. The bias in this case is obtained just as it is in a self-controlled oscillator — by the use of a grid leak through which the d.c. grid current flows. The parts required are a grid leak, R_5 in Fig. 1, a grid condenser, C_5 , tuning condenser and inductance, C_2 and L_2 , which will tune over the 7000-kc. band, blocking condenser, C_4 , and an r.f. choke, as well as a 5-prong tube socket and a center-tap resistor. The grid condenser and leak are mounted under the board at the center. All other parts except the r.f. choke are mounted on the upper side of the baseboard, at the left-hand side.

Between L_1 and L_2 is a single-pole double-throw porcelain-base switch, connected as shown in Fig. 1, for the purpose of connecting the oscillator to the doubler. The blade is connected to the stator plates of C_1 and one of the jaws to the buffer grid condenser. The other jaw is left unused for the moment, but will be used with the amplifier unit to be described later. This switch disconnects the doubler when the set is to be used on the 3500-kc. band. A piece of bus-wire run along the top of the baseboard at the rear connects the center-taps of the two filament resistors together. The plate-voltage for the doubler is fed in by means of a Fahnestock clip on the rear edge of the board.

A quite simple scheme is used for coupling the antenna coil to the tank coil of either stage. This coil, like the other two, is wound on a piece of bakelite tubing, and this in turn is fastened to a piece of brass strip, the other end of which is

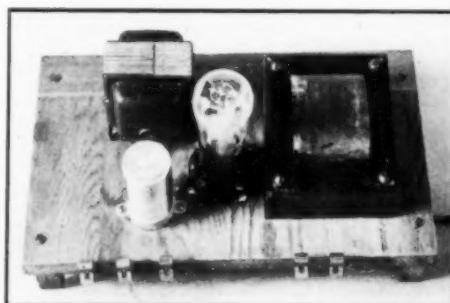
held to the rear edge of the baseboard by a wood-screw midway between the two coils. By making the brass supporting strip the proper length and carefully centering the wood-screw, the antenna coil can be swung from one tank coil to the other, and any degree of looseness of coupling can be obtained simply by positioning the antenna coil correctly with respect to the tank coil being used. A pair of flexible wires from the ends of the coil make connection to two Fahnestock clips on the rear edge of the board, these serving as terminals for the antenna or feeder connections.

POWER SUPPLY

Any of the power supply units made from broadcast receiver parts described previously in *QST*,¹ *How To Become a Radio Amateur*, and *The Radio Amateur's Handbook* will work satisfactorily with the transmitter. We show one here, however, which is somewhat more suitable for this particular job because the voltage regulation² is much better than with those heretofore described. This is because the filter has been arranged with the output of the rectifier feeding into a choke instead of a condenser. A choke-input filter with a bleeder of the right size is capable of much better output voltage regulation than a condenser-input filter, especially when a mercury-vapor rectifier is used as in the present case. The disadvantage of choke input is, however, that the output voltage is somewhat lower than the secondary voltage of the transformer used, and is considerably lower than the output voltage obtained with condenser input with the same transformer at all except the heaviest loads. On the other hand, with choke input much more current can be taken from the rectifier-filter system without endangering the life of the rectifier tube than is possible with condenser input. With ordinary broadcast power-pack transformers, which have a secondary voltage of 350 to 400 volts each side of the center-tap, the output voltage drops to around 300 volts with choke input, whereas for a reasonable amount of power output it is desirable to have about 400 volts for the plates of the r.f. tubes.

Now that the 82 mercury-vapor rectifier tubes have made their appearance, however, transformers designed to give about 400 volts output with a choke-input filter have become available, and such a transformer is used in the power supply shown in the photograph. This one is made by Silver-Marshall, and has a high-voltage winding which delivers 520 volts each side of the

center-tap. In addition there are two 2.5-volt windings for lighting the rectifier and other tubes in the set. Since the transformer is designed for horizontal mounting in a broadcast receiver chassis, the same type of mounting has been employed here, a rectangular hole being cut out of the power-supply baseboard so that the side of the transformer on which the terminals are brought out will drop through to the under side of the board. The transformer is held to the base-



POWER SUPPLY

A simple filter with choke input gives good regulation. The transformer must have higher output voltage than ordinary broadcast receiver transformers, however.

board by four bolts which pass through holes in the core.

The rectifier tube socket, filter choke and filter condenser are mounted on top of the baseboard, the latter projecting through a hole in the board so that the connections are underneath. All other connections drop through the board also, which makes the top look neat because all wiring is out of sight. The choke should be rated to carry about 150 milliamperes and should have an inductance of 25 or 30 henrys. Get one with a fairly low-resistance winding—not more than 200 ohms or so—because the voltage regulation of the power supply will be largely dependent upon the choke resistance. The filter condenser is an 8-μfd. dry electrolytic, rated at 450 volts. This rating is not exceeded with a bleeder of the resistance shown in Fig. 2, which is the complete wiring diagram of the power supply.

One of the photographs shows a glimpse of the bottom side of the power supply baseboard. No attention need be paid to niceties of appearance here, and the only point to watch is that all the wires are adequately insulated. The bleeder resistances are mounted on small bits of metal strip. The condenser C_2 , a mica receiving condenser of any capacity in the vicinity of .001 or .002 μfd., the purpose of which is to prevent back-coupling between the oscillator and doubler through the bleeder resistance, is also mounted underneath the board. As in the transmitter, the terminals are brought out to Fahnestock clips fastened to the rear edge of the board. The bare

¹ See following issues of *QST*: July, 1932, pages 11 and 12; November, 1932, page 11.

² Voltage regulation is defined as the ratio of the difference between full-load voltage and no-load voltage to the full-load voltage. A power supply whose output voltage changes very little from no load to maximum load is said to have good regulation. See the "Power Supply" chapter of *The Radio Amateur's Handbook* for more complete discussion.

braided lead from the electrostatic shield between primary and secondaries of the power transformer is connected to the center-tap of the high-voltage secondary, as shown.

ANTENNAS

Every amateur who has been on the air for any length of time has his own preferences as to antennas and tuning systems. However, for the

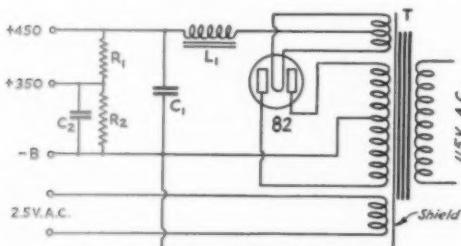


FIG. 2 — POWER SUPPLY WIRING DIAGRAM
T — Power transformer; see text for description.
 L_1 — 30-henry, 150-milliamperes choke.
 C_1 — 8 μ fd. dry electrolytic condenser, Aerovox.
 C_2 — .002- μ fd. mica condenser.
 R_1 — 20,000-ohm wire-wound resistor, 25-watt size.
 R_2 — 20,000-ohm wire-wound resistor, 25-watt size.

sake of those who may be putting in their first transmitters we have a few suggestions to make.

Generally the chief factor in determining the kind of antenna to put up is the amount of space available. If there is room enough, the Zepp antenna shown at A in Fig. 3 is a good one to use. The radiator, or antenna proper, is approximately 130 feet long, and the two feeders are 30 to 35 feet each. These should be spaced about 6 to 8 inches apart with spacers such as those described in the chapter on "Antennas" in *The Radio Amateur's Handbook*. With feeders of this length it is necessary to use series tuning on 7000 kc. and parallel tuning on 3500 kc. as shown at A and B respectively.

Series tuning requires two condensers, which should have a maximum capacity of about 250 μ fd. each. Any type of variable condenser will do for this purpose. For changing the feeder tuning system rapidly when shifting from one band to another, a switching arrangement such as the one described a few months ago in the Experimenters' Section will be convenient.³

If space does not permit putting up a Zepp, a single-wire antenna with a total length of about 65 feet from the transmitter to the far end may be used. This also will call for different tuning methods on each band, but only one antenna condenser will be required in either case. Fig. 3C shows the method used for 3500-ke. operation, and Fig. 3D the 7000-ke. tuning system.

The specifications for the coupling coil, L_3 in Fig. 1, will be correct with either of the antenna systems recommended above. With other types

³ QST, December, 1931, page 38.

of antenna or Zepp feeders of different lengths, it may be necessary to use a larger or smaller number of turns. If this should be the case, the right number of turns must be determined by experiment.

TUNING

A milliammeter of some sort is almost a necessity for tuning and for making sure that the tubes are not overloaded. Even a cheap meter is better than none at all. A neon lamp also is a handy thing to have for indicating r.f. A low-range r.f. ammeter (0-1 ampere is about right) is helpful but not really necessary; a two-volt flashlight lamp can be substituted for it in making tuning adjustments.

After the power supply connections have been made to the set, the crystal should be plugged in and the oscillator tested. To do this open the switch S , if the doubler part of the set has been built, and move the antenna coil as far away from the oscillator coil as possible. A switch or telegraph key should be placed in the negative lead from the power supply so the plate current can be cut off without turning off the filaments. Close the switch or key and turn C_1 until there is a pronounced dip in oscillator plate current, indicating oscillation. Generally the plate current will be about 50 milliamperes non-oscillating, and will drop to 20, approximately, when oscillating. The more active the crystal the lower will be the plate current with the tube oscillating.

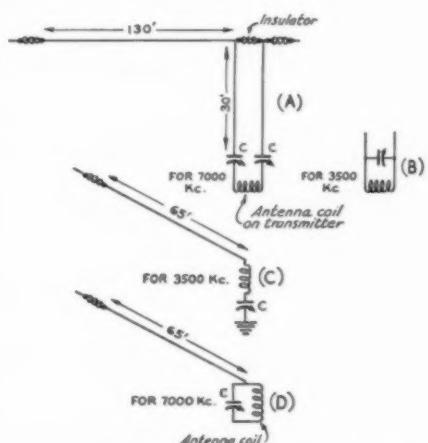


FIG. 3 — TWO SUGGESTED ANTENNA SYSTEMS

It is very much worth while to get a good crystal, especially for a small set of this sort in which the oscillator must be keyed and from which it is desirable to get as much power as possible. A poor crystal is a bad investment, no matter how "cheap" it may be; get one from a reliable concern which will back up its product. If the set is to be used only in the 3500-ke. band,

any frequency within the band will be satisfactory. If the set is to be used on 7000 kc. as well, the frequency must be between 3500 and 3560 kc. to keep within the 7000-7300-ke. limits when doubling. Similarly, if 14-me. operation is to be tried at some future date, the crystal frequency must be between 3500 and 3600 kc.

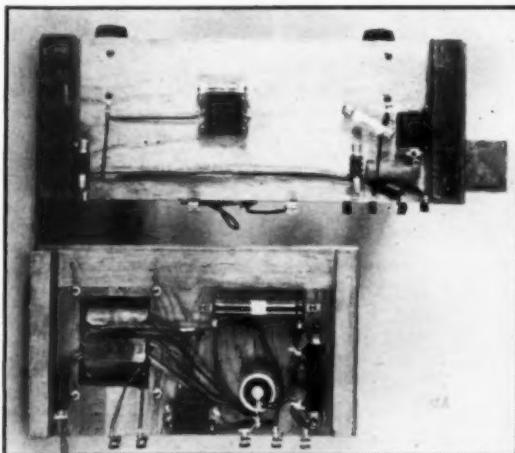
Once the oscillator is functioning, the antenna coil may be coupled to it and the antenna or feeders tuned to resonance. If the antenna condenser or condensers are in series with the feeders, as at A and C, Fig. 3, the two coils will probably be coupled closely together. If parallel tuning, as at B and D, is used, however, the coupling generally will be fairly loose; that is, the axes of the two coils will not be on the same line. Adjust the antenna tuning until the ammeter or other resonance indicator shows maximum current. Almost certainly a readjustment of C_1 will have to be made when the antenna coil is coupled to L_1 . Manipulate C_1 and the antenna condenser until the antenna current is greatest. If too much coupling is used the oscillator may stop working, in which case the coupling must be backed off.

There is one other factor which must be considered when working on 3500 kc. It is necessary to have the oscillator key properly, and to make certain that this is accomplished the signal should be monitored. If dots are missing or if the keying sounds chirpy, the tuning must be readjusted until the keying is clean and the oscillator starts every time. This may necessitate a slight reduction in antenna current.

OPERATING THE DOUBLER

Tuning the doubler is much the same as the procedure used with the oscillator. The antenna should be disconnected from the coupling coil or the latter placed midway between L_1 and L_2 and the switch S closed. In this case the milliammeter should be in the plate circuit of the doubler. Start the crystal oscillating — the neon lamp will be useful at this point to indicate oscillation if no milliammeter is available for the oscillator plate circuit — and note the rise in the doubler plate current. Then tune C_2 for minimum plate current, the minimum point indicating resonance. The plate current with C_2 set off resonance will be determined by the oscillator strength; with the oscillator condenser, C_1 , set for maximum output the off-resonance plate current will be from 100 to 150 milliamperes, and at resonance should drop to 30 or 40 ma. Always keep C_2 set at resonance because under other conditions the plate power is all dissipated in the doubler tube itself and the tube will get hot. This may be the cause of grid blocking, a condition in which the grid emits electrons and causes still higher plate current, with the result that the tube may be ruined.

The antenna coil should be coupled to the doubler tank coil and tuned in just the same way as has been described previously. The plate current with the antenna coupled should be 50 to 60 milliamperes; do not try to load the doubler too



BOTTOMS UP

Underneath the transmitter and power supply baseboards. The parts can be identified easily by referring to the text.

much or blocking may take place with the result described above.

With the Zepp antenna shown in Fig. 3, the feeder current will be in the neighborhood of .3 to .4 amp. on both bands at the recommended plate voltages and with a normally active crystal.

KEYING

The simplest method of keying the oscillator, putting the key in the -B lead from the power supply, has already been suggested. Center-tap keying may be used — with less danger of key thumps in neighboring broadcast receivers — if filament-by-pass condensers are substituted for the center-tap resistors shown in Fig. 1 and a center-tap resistor connected across the filament winding on the transformer in the power supply unit. The key might also be placed in series with the oscillator grid leak, R_3 , at the filament side, or in series with the screen dropping resistor, R_4 . Either of the last two methods is likely to result in a back-wave when the key is open because the tube may not be completely stopped from oscillating.

If the set is to be used on 7000 kc. only, there are two other keying methods available in addition to those mentioned above. The key can be placed in the positive plate voltage lead to the doubler tube, leaving the oscillator running continuously, or it can be used in place of the switch S , in which case it breaks the excitation to the doubler. The oscillator works continuously in

(Continued on page 90)

An All-Wave Midget Receiver

A Semi-Portable Covering from 12 to 4500 Meters

By R. B. Parmenter*

THREE is consistent demand for a compact and semi-portable receiver that is battery operated and that covers both high and low frequencies. It's handy to have around the shack for occasional listening in on what the long-wave commercials are doing or, even, for taking in an occasional broadcast program. And it's just

market it is rather difficult to decide just which ones are the best for portable use. The choice depends on how much output one wants and how much battery weight can be lugged around. However, a '32 screen-grid detector and a '33 pentode audio make a nice combination and give all the output that two sets of headphones need. Considerable current is used by the filament of the '33, but if strong signals are desired it is the tube to use.

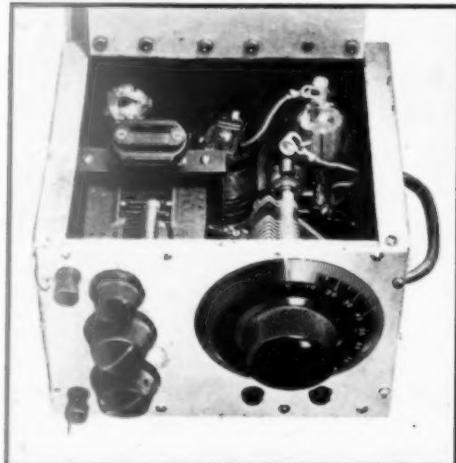
CONSTRUCTION

The entire receiver was built from whatever was available and in casting around for a metal cabinet an old defunct "2-mike" filter condenser case was picked out to house the receiver. It is of sheet iron and measures $5\frac{7}{16}$ by $7\frac{1}{2}$ by $6\frac{1}{2}$ inches. Several layouts were tried but, like a Chinese puzzle, only the one shown would permit getting everything inside with the lid closed and all controls on the front panel.

The top of the iron case was cut out to take a hinged top so that coils could be changed without too much trouble. The lid is of $1\frac{1}{16}$ -inch aluminum, $6\frac{1}{4}$ by 6 inches. A strip of $\frac{3}{4}$ -inch of the original iron was left so as not to weaken the case.

The top and two sides of the cabinet, into which the front panel is fastened, are strengthened by $\frac{1}{4}$ -inch square brass which is tapped and fastened both to the cabinet and the front panel. The panel and sub-panel are of $\frac{1}{16}$ -inch aluminum, the panel being $7\frac{1}{2}$ by $5\frac{3}{8}$ inches and the sub-panel 5 by $6\frac{1}{2}$ inches. The shelf is fastened to the panel with another length of square brass with $\frac{1}{2}$ -inch room to mount condensers and run some of the wiring underneath. All of the parts are mounted so that by removing six screws in the panel and one in the back, the entire receiver may be taken out of the cabinet. The one screw in the rear is fastened into a small length of square brass which is fastened to the shelf. This prevents sagging or vibrating.

The upper post on the front panel is for the antenna and the lower post for the ground. The three knobs are (beginning at the top) antenna series condenser, filament rheostat and regeneration control. The main tuning dial is the only other control. The antenna series condenser may seem an unnecessary luxury but it is a life saver in avoiding dead spots due to antenna resonance and is almost indispensable in a set that has no r.f. ahead of the detector. It is also useful when using the low-frequency coils. One of the rotor



A MIDGET THAT COVERS PRACTICALLY THE ENTIRE FREQUENCY RANGE OF LONG-DISTANCE RADIO COMMUNICATION

Antenna condenser, regeneration and filament controls are at the left. The tip-jacks below the tuning dial are for the headphones.

the thing to take on a vacation trip to copy traffic from the OW as it is broadcast on schedule by home-town hams. The receiver described here was built with these ideas in mind. It has just returned from a 2000-mile auto trip during which it did itself proud — and is still hitting them off in fine shape. Both short and long waves are covered by means of interchangeable plug-in coils, all of which are on moulded bakelite formers of $1\frac{1}{2}$ inches outside diameter. A total of 9 coils gives practically continuous coverage of all frequencies between 60 kc. (5000 meters) and 25,000 kc. (12 meters), with three more giving band-spread tuning of the "80-", "40-", and "20-meter" amateur bands. A double-section tuning condenser takes care of the L-C ratio requirements of the different ranges.

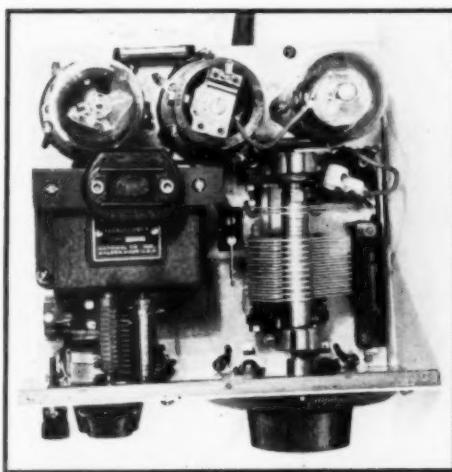
With so many different types of tubes on the

* Chief Operator, A.R.R.L. Headquarters Station W1MK.

plates of this condenser is bent so that when maximum capacity is reached the condenser is shorted out. This position is useful for the low-frequency ranges and also when working without a ground on the receiver.

The tuning condenser is a National ET-27 which was formerly used in an all-wave super-het. It has two sections with a small switch to cut out the larger section and allow the use of three plates in the rear for the high-frequency ranges. The switch is to the left of the condenser. It was necessary to put this switch on as it does not come with the condenser. A clip may be used instead but is not as permanent or convenient. The coil socket is mounted off the sub-panel $\frac{3}{4}$ -inch to keep the coil clear of the metal. The '32 detector has a sub-panel type of socket while the '33 has a socket which is mounted above the panel. The plug-in mounting to take the extra plate by-pass condensers is mounted above the screen-grid coupling unit. Between this and the panel is the .25- μ fd. by-pass condenser which is across the regeneration control. The permanent plate by-pass condenser of 500 μ fd. capacity is mounted behind the coil socket. The r.f. choke is mounted to the right of the tuning condenser, as is the grid leak mounting. The screen-grid by-pass capacity of .01 μ fd. is mounted under sheath, right at the screen-grid terminal on the socket. The grid condenser is mounted to the rear of the tuning condenser with its grid lead and clip next to the tube. This is the clip that is connected to the grid of the detector for all coils except the band-spread coils, which have their individual leaks, condensers and grid clips. The r.f. choke is

a cross between a low-frequency and a high-frequency choke and is of the open type that is used as a "replacement" in broadcast receivers.



A PLACE FOR EVERYTHING AND EVERYTHING IN ITS PLACE

The coils plug in between the screen-grid detector (right) and pentode output tube (left.) The extra plate by-pass plugs into jacks on the bakelite strip above the audio coupler. The midget switch between the coupler and tuning condenser cuts the larger section of the tuning condenser in circuit for the lower frequencies. The extra detector grid lead is used with the non-band-spread coils.

No serious dead spots were encountered in the range 15 to 4500 meters.

The plate by-pass condenser of 500 μ fd., which is plenty for the high-frequency ranges, is a little small for the long-wave coils as with it they will not oscillate over the entire range. Additional plate by-pass capacity is therefore plugged in the mounting for that purpose. Three plug-in condensers should take care of this, 500- μ fd., .001- μ fd. and .002- μ fd., which are fitted with G.R. plugs to fit in the mounting.

It is hard to get perfect control of regeneration in a receiver of this type without using a variable plate by-pass condenser. However, with the plug-in capacities the low-frequency coils can be made to oscillate over their respective ranges and by dropping the screen-grid voltage to 22½ volts, and leaving off any extra by-pass capacity, it is possible to get perfect control in the useful range 550 to 900 meters. With different combinations, such as the antenna series condenser shorted out, etc., it is possible to cover the entire range and here on the East Coast the signals in this range have a nice punch. It is interesting to listen to

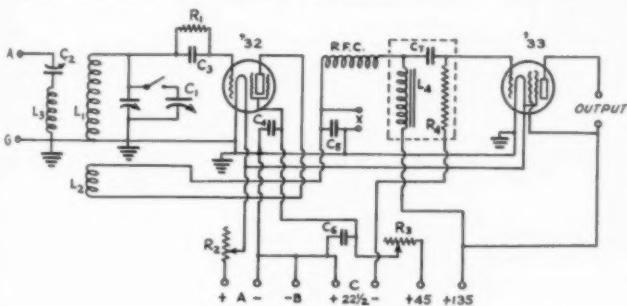


FIG. 1 —

C₁ — National ET-27, total maximum capacity 490 μ fd. Three-plate separate section of ET-27 is 50- μ fd. maximum.

C₂ — 100- μ fd. midget.

C₃ — 250- μ fd. mica.

C₄ — .01- μ fd. mica.

C₅ — 500- μ fd. mica.

C₆ — .25- μ fd. paper.

R₁ — 2 megohm (Individual leaks and condensers on band-spread coils).

R₂ — 60-ohm rheostat.

R₃ — 50,000-ohm rheostat.

RFC — Broadcast-band r.f. choke, inductance approximately 50 millihenries.

L₆, C₇, R₄ — National S-101 screen-grid coupler. All parts enclosed in one case.

L₁, L₂, L₃ — See coil table.

X — Plug-in position for extra plate by-pass capacity.

the 600-meter gang and hear some really good operating procedure. It affords good code practice, besides. Also, a receiver which covers these frequencies is very useful in getting the weather forecasts and storm warnings.

THE COILS

The coil forms are all five-prong Silver-Marshall and specifications are given in the accompanying coil tables, including the spacing between the windings. Fig. 2 shows the wiring for the band-spread coils and should make this clear.

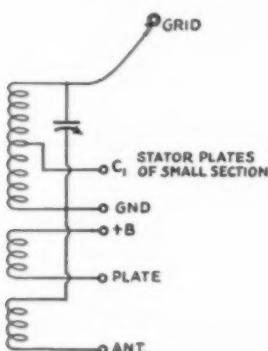


FIG. 2—SHOWING CONSTRUCTION OF THE COILS. A GRID LEAK AND CONDENSER MUST BE INCLUDED IN GRID LEAD—NOT SHOWN HERE

The low-frequency coils require forms somewhat longer than the standard type and the additional length was obtained by bolting on an extension consisting of a standard form with its pin end cut off. The top of the form used for the extension was butted against the top of a regular form, as shown in Fig. 3, and brass 4-36 machine screws were run through holes drilled through the form, into small pieces of brass strip tapped for these screws. Two of these fastening strips were used for each form. This makes a long form which is very rigid.

Just a few words about the low-frequency coils. Because of the small space available in the receiver it was of course impossible to make use of the usual size honey-comb coils. An attempt was first made to bank wind them using No. 30 wire. It was a messy job at best; the small size wire made it impossible to get them to hold their shape, so this was given up and the coils used were wound up to our specifications, using Litz wire on the two largest coils and No. 22 wire on the broadcast coils. They are all made to slip on over the 1½-inch diameter five-prong coil form and all are "universal" wound. The inductances of the various coils are given in the table.

The coupling between the plate and grid coils is rather critical and the antenna coil influences

the range somewhat so the best procedure in getting the proper spacing of these coils is as follows:

After sawing off the end with the prongs of the form extension, five flexible wires were soldered in the pins of the end cut off and this was inserted in the detector coil socket as a sort of adapter. The antenna, grid and plate coils were then slipped on one of the completed coil forms, with the antenna coil at the bottom, the grid coil in the center and the plate coil at the top. This differs from the line-up for the high-frequency coils and was necessary in order to get sufficient coupling to the antenna coil. The form with its three windings was then connected "haywire" style to the five wires from the coil socket, being sure to get them connected to the correct points as it is possible to burn out the tube filaments if one is careless. The plate coil is then backed off or slid back to where it oscillates properly. The antenna coil will, of course, influence this also, so adjustment must be made on it as well. The closer the antenna coil is to the grid coil, the closer the plate coil must be in order to get it to oscillate. It does not pay to use too close coupling between the antenna and grid coils as this throws off the calculated frequency range and just enough coupling should be used to bring in the signals with good volume. The spacings given were found to be the best in our particular case. In case the receiver howls badly the trouble may be due to too loose plate coupling so that the circuit is just on the edge of oscillation. Try tightening the plate coil coupling. Too close antenna coupling can cause the same thing. Some audio coupling between the headphones and the '33 pentode was bothersome in our case, and whenever the 'phone cords were accidentally near the back of the receiver howling resulted. This was noticed on the high-frequency coils. As soon as the coils were completed and the receiver fastened in the cabinet no more trouble was experienced, although by opening the lid and bringing the 'phones or 'phone cords near the top a terrific howl resulted — so do not be fooled by this.

Since the entire filament current is .32 ampere, the smaller types of dry cells are not suitable and No. 6 dry cells were decided upon as filament supply. The battery box presents somewhat of a weight but makes up for this by having enough batteries to operate the receiver for several

(Continued on page 86)

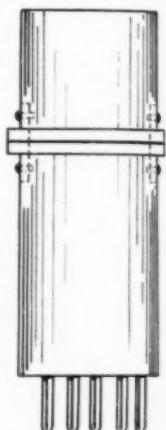


FIG. 3—See Text

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Efficiency in the Output Amplifier

Some Suggested Methods of Increasing Antenna Power

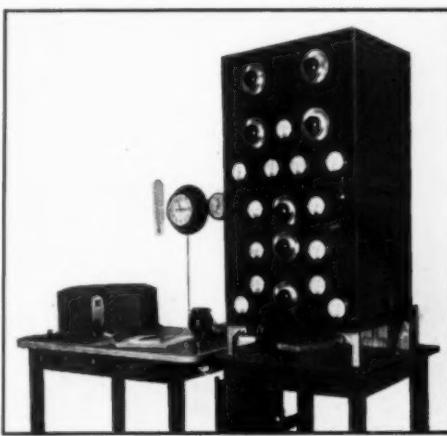
By Fred H. Schnell, W9UZ*

QST and the A.R.R.L. *Handbook* contain more information on amateur transmitters than any other publications. Yet, now and then it may happen that a suggestion or two would be helpful as additional information, especially for those who are interested in transmitters of the type that use two tubes in the output amplifier, push-pull. However, it is generally conceded that every amateur, no matter what power he uses, desires to get the most from what he has. To increase his signal strength reports from R_4 and R_5 to R_7 and R_8 , or from QSA3 to QSA5, he would gladly spend any reasonable amount of time trying one thing or another. This sort of work brings practical results; these results pass from one of us to another — and the whole fraternity of amateur radio profits by them. This is one of the very reasons why we amateurs are in existence to-day — we have gone ahead; we have tried new ideas; we have experimented with difficult radio problems; we have solved many of them; and we have passed the dope along through *QST*. We have not stagnated. If we had, we still would be using apparatus of the vintage of 1920 and perhaps older. True, our fundamentals are the same; but just think how they have been broadened in the adaptation of the modern apparatus in the modern amateur station.

The present transmitter in use at W9UZ has been in operation for more than a year. Just because it uses two 250-watt tubes in the output amplifier doesn't mean, necessarily, that it is a 500-watt transmitter. It may be more, but is as likely to be less, as we shall see. Generally, with two 250-watt tubes (output or plate dissipation) in push-pull, and with an input of about 1000 watts, efficiency of 50 percent might be expected, in which instance the output should be 500 watts. Now, power amplifier plate efficiency of 50 percent, and higher, is attainable. But everything in the transmitter must be just right if it is to be realized. Grid excitation to the output amplifier, plate tank circuit design, proper tuning and neutralization, antenna system and antenna coupling, all are just as much a part of the transmitter as the transformers, radio-frequency chokes, tubes and power supply. Very often we amateurs take these things too much as we imagine them to be and not as they really are.

This transmitter, for instance, started with a plate input of 1000 watts to the output amplifier

and the antenna power was about 250 watts. With but a few minor apparatus changes, a little figuring and thinking, and a couple of days' time, the antenna power was increased to more than 500 watts *with no increase in input*. The measuring gear which usually can be found around most ham shacks was used for making calculations and measurements, due allowances being made for such errors as are bound to crop up with gear of this type. Of course, precaution was taken in checking the measurements; otherwise they would have been of no value for comparison pur-



THE OPERATING POSITION AT W9UZ AND THE 500-WATT TRANSMITTER WHOSE OUTPUT WAS BROUGHT FROM LOW TO HIGH EFFICIENCY BY THE METHODS DESCRIBED

poses. The information is approximate, yet it has been useful for such comparisons.

THE TRANSMITTER LINE-UP

In this, the first push-pull amplifier of this power in use at W9UZ, the output amplifier and the antenna system are of principal interest because something new was learned about each one. The front end of the transmitter is much the same as several that already have been described in *QST* and can be covered briefly.

The supporting frame measures 16 inches from front to back, 20 inches across the front, and the front panel is 40 inches high. The supporting uprights are duralumin, $\frac{3}{4}$ - by $\frac{3}{4}$ - by $\frac{1}{8}$ -inch. Each aluminum shelf and compartment shield is $\frac{1}{8}$ -inch thick. The front panel, also aluminum, is

* 4915 No. Sawyer Ave., Chicago, Ill.

$\frac{5}{8}$ -inch thick and the two sides, back and top (all aluminum), are $\frac{3}{32}$ -inch thick. The uprights and cross members are rigidly fastened with angle pieces, machine screws and lock washers. Each side, the top and the back are drilled with $\frac{1}{2}$ -inch holes for heat ventilation.

Each radio-frequency choke is the Navy Type, three-section. Each section consists of one hundred turns of No. 30 B. & S. silk-enamel wire, universal type of winding, each coil being $\frac{3}{32}$ -inch in width and $1\frac{1}{4}$ inches in diameter, 1 inch spacing between each. The winding form is a $\frac{1}{2}$ -inch round bakelite rod, 5 inches long. These chokes cannot be wound by hand.¹

The inductor of the screen-grid (75-watt) amplifier is $3\frac{1}{2}$ inches in diameter, ten turns of quarter-inch copper tubing. The plate voltage is fed to the center of this inductor. The excitation to each of the 250-watt tubes is taken from this inductor, one from either end. A 0-100 d.c. milliammeter is connected in each grid lead. When the proper value of capacitance is used in

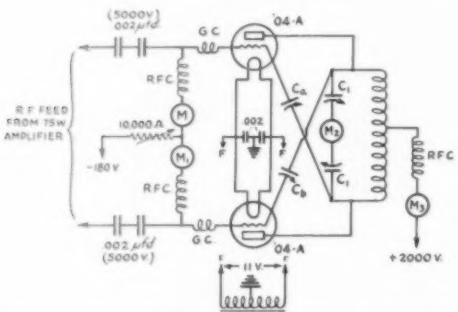


FIG. 1—THE PUSH-PULL POWER AMPLIFIER STAGE

M and M₁ are the 0-100 d.c. milliammeters indicating grid current. M₂ is a 0-10 thermocouple ammeter indicating r.f. tank current. M₃ is a 0-1000 d.c. milliammeter indicating plate current to the two tubes. The grid circuit parasitic suppressors GC are each 12 turns of No. 26 d.s.c. wire on a $\frac{1}{2}$ -inch diameter form, wound with $\frac{3}{16}$ -inch spacing between turns. The specifications for the remaining components are indicated on the diagram or given in the text.

combination with the proper value of inductance, each grid meter will indicate the same value of current, usually about 5 percent of the total plate current in the amplifier tubes. Generally, for a single tube, this grid current is about 10 percent of the plate current at normal operation. These meters are quite useful when tuning or making adjustments with no plate supply voltage on the amplifier. When the tank circuit is tuned to resonance with the frequency of the doubler stage, the grid meters respond instantly—they are much quicker than the sluggish r.f. ammeter in the plate tank circuit. There seems to be little use, if any, for an r.f. ammeter in a plate tank

¹ They were made by Mr. E. H. Thineman, 1428 North Wells St., Chicago, Ill.

circuit, since this meter does nothing more than indicate resonance. The amount of current can be made most anything desired, depending upon the capacitance and the inductance in the circuit; the higher the capacitance, the higher the current. Every amateur must be familiar with this.

Each amplifier tube is biased with batteries and a resistor as well; a sort of semi-automatic grid bias control. This type of grid bias, unless there is some good reason against it, can be recommended as preferable to either only batteries or only the resistor.

PUSH-PULL OUTPUT AMPLIFIER

Of course, this is the most important and the most interesting part of this transmitter. All the shuddering, fear and visions of sleepless nights that would have to be spent in getting this stage to work properly turned out to be nothing but wild imaginings. There has been nothing so simple as neutralizing this push-pull output stage. As a matter of fact, considerable care was used in shielding each unit of the transmitter. It still seems to be the same old story about shielding—"Partial shielding is a partial cure for something that should not exist in the first place and complete or proper shielding simply avoids those ailments." Stray high-frequency voltages are trouble makers and they should be restricted by the use of proper shielding. Perhaps that accounts for the fact that the amplifier was neutralized and tuned within a few minutes from the time the transmitter was first put into operation. The method of performing this operation is as follows:

Refer to Fig. 1. The filaments of the two 250-watt tubes are heated. The plate supply is disconnected. Grid bias of -180 volts is connected through the 10,000-ohm resistor. (The feed leads to the 75-watt stage have been connected and that stage has been tuned to resonance, as indicated by the two grid meters which show a deflection of 22 to 26 mA. The two neutralizing condensers C_a and C_b are at maximum capacity. A single turn of wire connected to a flashlight bulb serves as an indicator. The single turn of wire is insulated with tape so it can be mounted (temporarily) right in the tank circuit. The two condensers, C₁, are adjusted until maximum brilliancy is indicated by the bulb. Then the neutralizing condensers, C_a and C_b, are simultaneously turned slowly until the flashlight goes out, which it does when the amplifier is neutralized. Then a few very small adjustments are made down through the transmitter, carefully bringing everything into resonance. The flashlight bulb and loop are removed. Then plate voltage (reduced) is applied. If everything has been done carefully, the tank r.f. ammeter (M₂) will show current. It remains then only to increase plate power until the transmitter is operating at normal input. Antenna tuning should be

checked from time to time as power is increased to be sure it is taking the load properly. Note: The grid chokes (GC) are not necessary in this transmitter, since it works just as well without them. They were put in and taken out several times—and left in the last time as a matter of convenience because they had been soldered in place.

GOING AFTER EFFICIENCY

The output amplifier has provided no end of interesting experimental work from which materially better results have been obtained. The normal operating characteristics, at present, may be of interest. The d.c. voltage is 1950 with a load of 500 ma. The plate tank current is 4.4 amperes with the antenna drawing full load. The 7000- kc . plate tank inductor, L_4 , is $3\frac{1}{2}$ inches in diameter, 12 turns of $\frac{1}{4}$ -inch round copper tubing with $\frac{1}{4}$ inch between turns. The inductance is 8.8 microhenrys. The tank circuit tuning capacitors (C_8) are National Type TM-450 condensers, double-spaced and connected in series with the r.f. ammeter (M_2) connected between them. The capacitance at 7173 kilocycles is about $45 \mu\text{fd}$., plus tube and associated capacitances. The plate current is 40 ma. with the antenna disconnected, a power input of about 78 watts.

W. H. Hoffman, W2BEP, suggested that the plate load impedance for Class B amplifiers (three-element tubes) should be at least twice the impedance of the plate of the tube for high efficiency. Several calculations were made and these were checked by measurement during the experimental work. Starting with a tank inductor of 2.3 microhenrys and a tank capacitor of $210 \mu\text{fd}$., the plate current (antenna disconnected) was 210 ma. or more than 400 watts in the tube-plate and associated circuits, as compared to the low- C dissipation of 78 watts. The measured r.f. tank current was 28.0 amperes at 7173 kilocycles. The r.f. tank current was calculated as 29.9 amperes using the inductive-reactance formula, and for capacitive-reactance was 29.3 amperes, the radio-frequency voltage per tube being taken as 70 percent to 80 percent of the applied d.c., the value being doubled for the push-pull amplifier, in this case approximately 3100 volts.

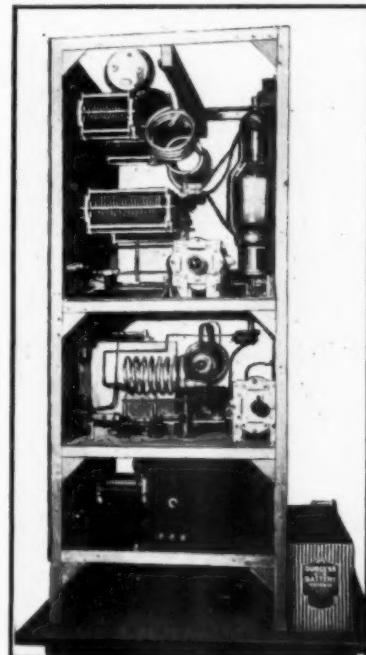
Changes were made in the tank inductor and capacitor

by a four-to-one ratio. The inductance was increased from 2.3 microhenrys to 8.8 microhenrys and the capacitance was reduced from $210 \mu\text{fd}$. to about $45 \mu\text{fd}$. The tank current was again calculated; inductive-reactance, 7.9 amperes; capacitive-reactance, 7.8 amperes. The measured current was 7.3 amperes, with the antenna load disconnected; the plate input, as mentioned, about 78 watts—and tubes cooler, much cooler.

These approximations serve their purpose in pre-determining what may be expected at normal tube operation. There is no sense in buying an r.f. ammeter with a 0-10 scale (if one still insists on having it) if the maximum current is going to be between two and three amperes. The two experiments bear out Hoffman's suggestion quite reasonably and efficiency increases can be expected if heat losses in the plate circuit are to be considered. Why use a lot of power to heat the plate of a tube! A red-hot plate may make a nice ornamental room heater but it isn't heating the antenna, and that's where we'd like to see it "get hot."

This brings up the matter of high- C versus low- C . It is well known in the amateur field that an oscillator circuit using a large amount of capacitance and small amount of inductance is more "frequency stable" than a circuit in which the capacitance is small and the inductance is large. In some measure this is true because when a tube heats (and what amateur runs his tubes cool?) there is a change of internal capacity, but when the parallel or tuning capacity is large, (high C) the percentage of total capacity change is very small, hence less frequency "creeping." Also, the low load impedance tends to swamp the effects of changes in tube impedance and thereby stabilizes the frequency in the dynamic sense. In circuits of this type, the tank current may be extremely high because the circuit has low impedance. Too, the plate load may be approximately the same with the antenna load or without it, although this depends upon the "awfulness" of the circuit, the transformer coupling action and the amount of antenna resistance reflected back into the tank circuit. In practically any type of straight oscillator, the low-impedance plate load (high C) circuit is desirable.

However, in the r.f. power



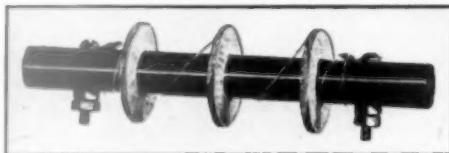
THE TRANSMITTER FROM ITS LEFT SIDE, SHOWING THE INTERSTAGE SHIELDING

The push-pull power amplifier occupies the top deck.

amplifier, where, for normal tube operation, high efficiency is desired, the high impedance (low C) plate circuit is more desirable.

ANTENNA SYSTEM

What do you suggest be done when you want a radiator about 67 feet long and the roof is only 52 feet long? There is only one thing to be done — bend it. That accounts for the bent feeder sys-



ONE OF THE NAVY-TYPE RADIO-FREQUENCY CHOKES

tem and the bent radiator in the Zepp-feed antenna system at W9UZ. Actually, it looks like the letter "Z." This antenna problem is far from being as simple as it sounds. All amateur antennas work after some fashion or another, but usually they are strung up without much thought and the final hitch is taken with a prayer that it will "do its stuff." Unfortunately, the antenna puts out only a part of the power that goes into it. Therefore, it is a good plan to put as much power into the antenna as can be put there. Too much of it goes down the gutter spout or drain pipe as it is, and antenna power is too precious to waste. It is just as precious as the power in the output amplifier, and the two must work together at all times for high efficiency.

As a beginning, the radiator for 7173 kilocycles was cut to a length of 66 feet 4 inches in accordance with antenna design data for a one-half wave radiator. The feeders were cut to 34 feet in length and they were spaced 6 inches apart with nice hard maple spreaders boiled in paraffin. The feeder and radiator wire is No. 12 enameled. The antenna system is located between two three-flat buildings, and it was necessary to mount two 32-foot masts on top of the two-flat house in which W9UZ is located. When everything was all tuned up and in operation for a month or two, signal strength reports seemed to average considerably below what was expected. Something was wrong — very wrong. WIEH accounted for not more than a pair of '10's in the output amplifier, judging by signals he received. So — a receiver and a galvanometer and a pair of 'phones were taken three miles away from the transmitter and some readings taken.

After getting everything all set so it would stay put, the galvanometer showed a deflection of 10 — that is, this was taken as the reference setting for further tests that were to come. The radiator was hauled down and cut in half, exactly, and a 0-3 ampere r.f. meter was connected

at the center (Fig. 2). Then it was hauled up again and the transmitter was tuned for maximum power into the antenna. Hold the key down; climb up on the roof; with a pair of binoculars read the current at the center of the radiator. It is 1.94 amperes. Receiver galvanometer deflection is 10. Haul down the radiator; cut off a few inches; make it 66 feet; climb down and retune for resonance; hold the key down; climb up on the roof; read the meter — it is now 2.1 amperes. Again the same motions for 65 feet 8 inches and the current is up to 2.4 amperes; next time, 65 feet with 2.6 amperes; and at 64 feet the current drops to 2.58 amperes — the critical length has been passed. And here is a case of stretching the antenna $3\frac{1}{2}$ inches on each half, a total of 7 inches in all. It isn't a hard job — copper will stretch, you know. At 64 feet 7 inches the current is 2.72 amperes. The three-mile away receiver reports a deflection of 17 divisions on the gal-

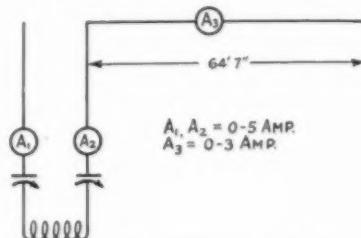


FIG. 2 — THE ANTENNA SYSTEM

vanometer. Surely, some improvement has been made.

Somebody said that antennas of this approximate frequency can be taken to have a resistance of 60 to 80 ohms, approximately. To measure the antenna resistance at this operating frequency and expect anything like accurate results is just a fond hope. However, after deciding that the resistance method was as good as could be had, a non-inductive resistor was made up as shown in Fig. 3. It measured 83 ohms at 1000 cycles — a 7-inch piece of "lead" from a pencil. This was connected in the radiator along with a 0-2 ampere r.f. meter, in the exact center. The transmitter was adjusted until the current in the meter was 2.0 amperes — enough power to make the resistor warm up. Then the radiator was hauled down and up (how many times!), and the resistance varied until the current dropped to 1.0 ampere, one-half the no-resistor value. The resistor was then removed and without making any change was measured at 1000 cycles — slightly more than 68 ohms. While this may be far from the actual resistance of the radiator as it would be measured with precision instruments, it serves as a guide — on which basis the power is taken to be more than 500 watts in the antenna (I^2R).

No attempt was made to measure the antenna

resistance at different lengths, in which there is bound to be some difference. In addition to what was obtained in current measurements, a nice case of a stiff neck was acquired. It isn't easy! As a basis for computing approximate power at the previously mentioned lengths, only as a matter of comparison for a given frequency, the antenna power at 1.94 ampere would be 255 watts; 66 feet and 2.1 amperes, 300 watts; 65 feet 8 inches and 2.4 amperes, 392 watts; 65 feet and 2.6 amperes, 459 watts; 64 feet and 2.58 amperes, 455 watts; and 64 feet 7 inches and 2.72 amperes, 500 watts, plus. All of it amounts to arriving at an increase of antenna power from something like 255 watts to 500 watts, brought about by trimming about 2 feet from the radiator length. Yes, signal reports have changed for the better by some decibels.

At W9BCL, operating in the 7000-kilocycle band, and using the same type of antenna system with a crystal-controlled oscillator and a 50-watt output amplifier having an input of 260 watts, the prescribed methods were followed in adjusting the antenna system. Before cutting, the cur-

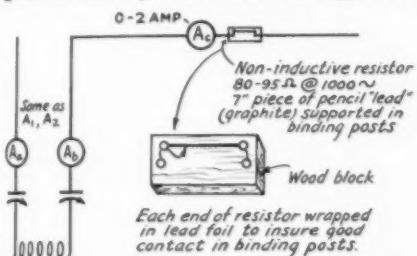


FIG. 3—AN APPROXIMATE CHECK ON THE ANTENNA RESISTANCE BY THE RESISTANCE VARIATION METHOD

rent was 0.7 ampere and, assuming 70 ohms (bad practice, assuming), the power was 35 watts. When the gang finished trimming 4 feet from his radiator, the current was 1.2 amperes and reports had jumped from R_4 and R_5 to R_7 and R_8 and even R_9 , according to W9AHQ, from whom this information was obtained by radio.

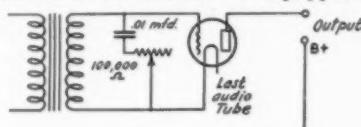
Audio Selectivity—Alias Tone Control

By Alton H. Goud, WICFO

MOST of us have heard of the indolent gentleman living under a leaky roof who remarked that when the sun was shining there was no need of worrying about the leak, and when it was raining it was too sloppy to go up and fix it.

So it is with audio selectivity. We can manage to get along without it when there are not too many stations on the air. But when the QRM sails in without warning, it is time to wish for something that we could twist and still follow that station who is rattling away in the bedlam, confident that we are copying everything.

There is something that we can do, and it is so overwhelmingly simple that the wonder of it is that all our receivers are not so equipped at the



present time. It is nothing but a tone control, such as our BCL friends have been using for the past two years.

A glance at the sketch will convince anyone of the simplicity, and a trial on your own receiver will show the effectiveness. It can be attached to any receiver, regardless of the audio system used. There are no traps to build or inductances to calculate. The values of the two units, .01 μ fd. for the condenser and 100,000 ohms for the volume control, are average and will work well with all transformer coupled systems. With resistance coupling it may be necessary to use a higher value of resistance in the volume control. This refers to the last audio tube only; it does not matter what kind of coupling is used in the first audio.

The writer uses and recommends the type of audio system which gives good bass response. Use good quality transformers whether you intend to apply this tone control or not. A low or medium ratio is best. A medium or low-pitched tone works through noise and QRM better, even without a tone control, and with one the effect is very gratifying. With the growing use of crystals and d.c. signals trying to pick out one station from three or four on the same frequency with the same kind of whistling note is very confusing, and it is almost uncanny as you turn the tone control down toward the bass to hear the interfering stations on both sides gradually fade away, leaving the signal you want with nearly as much volume as before. Hardly less gratifying is the ability to soften the sharp discharges of static, and to minimize the roar of a power leak.

Try a tone control on your receiver, and give the other fellow's signals a chance.

Keeping the Feeders Taut

WHEN Zepp feeders are pulled off at an angle from the antenna one wire usually is tight as a drum and the other hangs slack unless the separators are put on at just the right angle—which is not a right angle. A Memphisham suggests the arrangement shown in the drawing to overcome this. All the pull is concentrated on one point, and the actual connection of the live feeder to the antenna is made by a short piece of flexible wire.



A Sure-Fire Condenser Microphone

Full Design Details for the Amateur Builder

By Howard F. Anderson, W1BVS*

WHY, when you talk condenser microphone to most amateurs, do they throw up their hands and say "N.D.?" Well, probably because many condenser mikes are so insensitive that they require too much audio gain, are too complicated to make and too tricky to adjust. The one here at W1BVS has good sensitivity, is easily built and has a dual adjustment feature that eliminates the trickiness. It has given perfectly satisfactory results and most always causes comment on the part of the fellows worked because of the very good quality and lack of background noise.

The two most important features in a condenser mike are the adjustment of the tension on the diaphragm and the adjustment of the gap between the diaphragm and back plate. The two adjustments should be entirely independent of each other. Otherwise when the gap is right the diaphragm tension is likely to be wrong, and *vice versa*. If the adjustment to give the proper diaphragm tension for good frequency response makes the gap too great, then the sensitivity is poor. If the adjustment to give the proper gap for good sensitivity makes the diaphragm tension other than what it should be for good frequency response, then the "quality" is punk. Unlike the usual condenser mike intended for amateur construction, this one provides for independence of these two all-important adjustments and does it simply.

The materials used for this job require a minimum of machine work and are of a type that is generally available, the whole thing being built around an obsolete magnetic loud-speaker unit of a type widely distributed in years past and still to be found kicking around radio shop

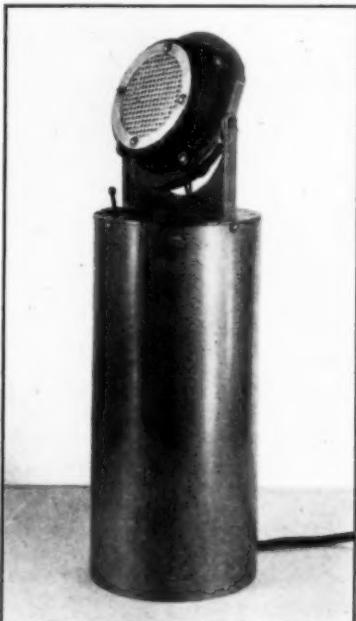
* 28 Maple St., Torrington, Conn.

"grave-yards" in goodly numbers. As an alternative to this unit, the whole head can be machined to the specifications given in the drawings.

First procure from the junk pile, or some of your friends, an old Atwater-Kent goose-neck speaker of the vintage of about 1925; the model number of this one is 630722. Any amateur will recognize this speaker. It has an adjustable unit in the base. Throw away the horn and unscrew the unit from the base and throw the base away too. Now dissect the unit and take out the pole pieces, magnets, diaphragm and tension ring. Save the tension ring and diaphragm and heave out the pole pieces and magnets.

The first construction is the back-plate mounting. Salvage a 4-prong bakelite tube base, break out the pins and cut off the top so that the shell is $1\frac{1}{16}$ -inch long, being sure that it is cut true. Drill out two of the pin holes and also drill two $\frac{1}{8}$ -inch holes to match in the back of the speaker unit so that the sawed-off base can be fastened on the little ears in the center. Also drill a $\frac{1}{8}$ -inch hole centered in the tube-base bottom, and countersink from the outside for the $\frac{3}{32}$ flat-head screw which goes up through the socket to hold the back

plate, as shown in the drawings. The back plate is made from a piece of brass $1\frac{3}{4}$ inches in diameter and about .020 inch thick, perforated with $\frac{1}{16}$ -inch holes. This can be obtained in any hardware store. A piece of the same material $2\frac{5}{8}$ inches in diameter is used on the front of the mike to keep poking fingers and other things away from the diaphragm. The back plate must be flat, and is soldered to the screw coming up through the center of the tube base. This plate forms one connection of the mike, the shell being



THIS PROFESSIONAL APPEARING AND WORKING CONDENSER MICROPHONE HAS SEPARATE ADJUSTMENTS FOR DIAPHRAGM TENSION AND CONDENSER GAP, GIVING HIGH SENSITIVITY AND EXCELLENT FREQUENCY RESPONSE. THE HEAD AMPLIFIER IS CONTAINED IN THE BASE

the other. This completes the rear section.

Now for the diaphragm and front end. First take the front shell and make a hole $1\frac{1}{2}$ inches in diameter in the center of it. This can be turned out in a lathe or made by drilling a row of holes and using a hammer and chisel, with a file for finishing. Also drill the four $\frac{1}{8}$ -inch holes for mounting as shown in the drawing and photographs.

Now make up the three rings as per the drawings. These are of brass and can be turned out very easily in a lathe. In case one is not handy, the two diaphragm rings can be cut out of flat stock, the circle-of-holes method being used to make the openings. These rings must be flat, and can be made so by putting a piece of No. 00 emery cloth on a flat piece of board and grinding them with a circular motion until a really flat surface is obtained. On the tension ring (the one with the projecting lip) a little ingenuity on the part of the amateur will be called for. If a lathe is available, the whole thing can be turned out of one piece of brass. If hand tools are the only recourse, the logical procedure is to make the two pieces separately and sweat them together with solder. One thing to remember is that the projection of the tension ring that goes against the diaphragm must be smooth and have no burrs or rough spots. Otherwise when the ring is drawn up it may punch a hole in the diaphragm.

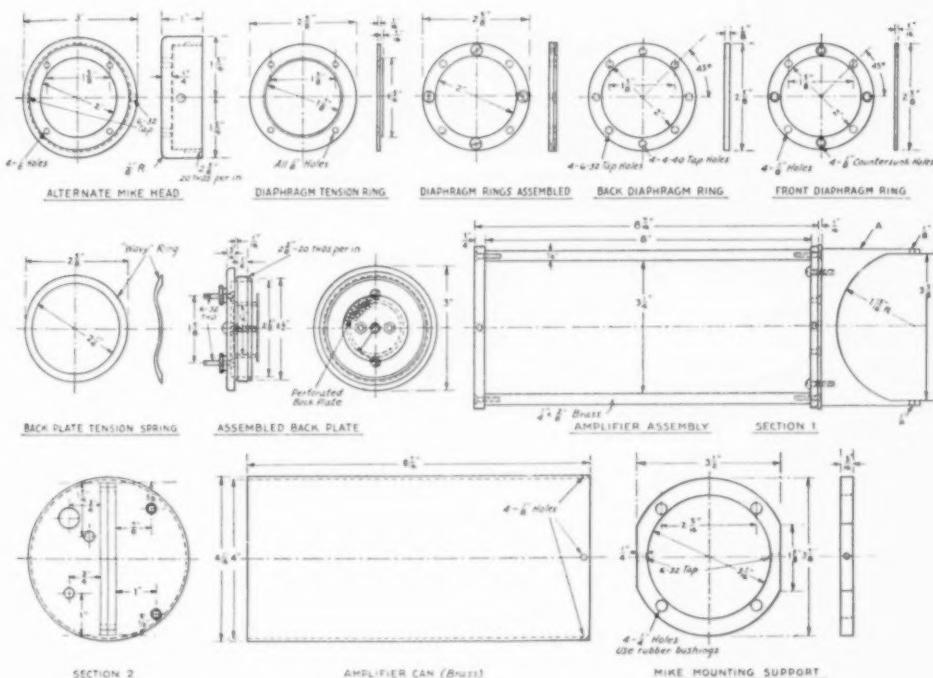


FIG. 1 — DETAIL OF THE CONDENSER-HEAD COMPONENTS

The diaphragm is made either of duraluminum .001-inch or less thick, or of the foil from a cigarette package. That from "Old Gold" is about the right thickness and tensile strength. If you use the foil take it off very carefully from a new



THE ESSENTIALS OF THE CONDENSER UNIT

They go together in the order shown, from left to right, and are identified as the front cover screen, head casing, diaphragm tension ring, diaphragm and diaphragm ring assembly, back-plate tension spring and, finally, the back-plate assembly. Further details are shown in the drawing.

package, so as not to make any creases or pinholes in it, and cut it out the same size as the old diaphragm, using the latter as a templet. Before cutting, however, put the tinfoil on a smooth piece of paper such as a page from *QST*, making sure there is no dirt under it, and smooth with a soft piece of cloth. After cutting out the diaphragm, put it in between its two rings and

tighten the four small screws which hold it in place.

Now for the assembly. The diaphragm tension ring goes into the front of the unit first, with its flat surface toward the front. Be sure the four



THE AMPLIFIER ASSEMBLY SLIDES OUT OF ITS SHIELD

A Type '30 tube is used. The condenser head fits in the forked mounting and can be tilted to a convenient angle.

holes in the front of the unit line up with those in the tension ring. Next put on the front plate or screen and insert the four screws. Then put in the diaphragm assembly with the thin ring toward the tension ring. Line up the screws and take up

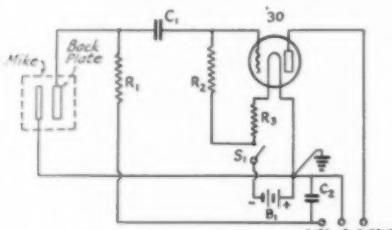


FIG. 2 — CIRCUIT OF THE HEAD AMPLIFIER
 R₁ — 3-meg. coupling resistor.
 R₂ — 5-meg. grid resistor.
 R₃ — 17-ohm filament resistor (20-ohm unit with 3 ohms shorted).
 C₁ — 0.006 μ fd.
 C₂ — 1.0 μ fd.
 S₁ — Single-pole single-throw "A"-battery switch.
 B₁ — Two flash-light cells (large type) in series.
 "Ground" indicates connection to shield.

on them a bit. Be sure and take up evenly on all four screws until you see the wrinkles in the diaphragm just disappear. Do not take up much after this occurs because that is about the proper

tension. Now slip in the spring (the wavy ring) that keeps tension on the back part of the unit, and screw in the back section.

Before going further, connect a dry cell and a pair of 'phones, or high-resistance voltmeter, in series across the mike terminals. If you screw in the back part of the mike carefully you will hear a click and a grating noise, when the diaphragm and back plate just touch. *Do this very carefully — you might ruin the diaphragm.* When you hear the click (which means that the back plate is against the diaphragm), back off just a hair and blow on the diaphragm, not too hard, and adjust until there is no noise.

This completes the head unit. The mounting and amplifier can be made to suit the individual, but one thing must be remembered. *Keep the lead from the back plate to the grid condenser and grid as short as possible.* As shown by the photos, the tube is hung upside down in the head amplifier to make these connections meet this requirement. The head-amplifier shield can be cylindrical like the one shown, which is 4 inches in diameter and 8½ inches high, or can be square. A dry-cell "A" battery for a Type '30 tube may be placed right in the shield, as is done in this case. With a tube drawing more filament current it would be necessary to use an external "A" supply and an additional pair of leads in the cable. The circuit of the head amplifier is shown in Fig. 2.

As to the number of stages necessary for good output, here at W1BVS I use either of two amplifiers. One is a Western Electric 7-A which has one '12-A in the first stage and two '71-A's push-pull in the second stage. The other amplifier is single stage using a '33 pentode. Either of these works into a pair of '45's push-pull; and these excite two Type '10's as Class B modulators. And the '10's will put out 50 watts of audio nicely, as I can prove.

So there is nothing terribly complicated about a condenser mike, and any amateur who knows how to use a few tools can build one. The drawings show an alternative design in case one has the facilities of lathe to turn one up. When using the mike, do not put it inside a copper or tin box that may be subject to mechanical vibration and which will set up an unpleasant ringing sound.

If a little care and patience are observed, I am sure that any amateur can build a mike as good as this one and I know it will improve the quality of the output from his station. It is well worth the time and small amount of money spent.

Strays

W9GXI has an 82 that has been giving service for a month at 950 volts and 150 mils, and has been used intermittently at 1125 volts and 200 mils — and this with a condenser-input filter. Some tube!

A Lesson from the Commercials

Describing Some Simple Methods of Protection for the Amateur Station

By Don H. Mix, WITS*

WE AMATEURS have taught the commercials and broadcasters many a lesson — no doubt about it — they admit it. However, we ourselves must also admit that occasionally these engineers do contribute technical ideas and policies which we may use to advantage, and we usually do so. But there is one idea which commercial and broadcast engineers have been dangling in front of our noses for years, an idea which would save us thousands of dollars yearly, and yet we have taken no cognizance of it. Perhaps it has been held too closely to our noses to be readily distinguishable. The idea to which I refer is that of proper protection of our valuable transmitting equipment, to say nothing of our lives, limbs and pursuit of happiness.

Newspapers and "hot stuff" radio magazines say radio is still in its infancy. I don't share this opinion, at least as it applies to the amateur. I believe the amateur is at least in the kindergarten stage. With this maturity upon our shoulders, it is time we gave some thought to making the operation of our transmitters safer, less destructive and more fool-proof.

I have read *QST* since its birth and never miss the section devoted to the description of individual stations. This section has covered some of the best ham stations in the world and yet I cannot recall a single instance in which mention was made of more protection than primary fuses — and I'll bet if some of these were removed, we'd find a portrait of a very badly pock-marked Mr. Lincoln underneath. A modernized version of an historical theme-song might fit this situation, "Millions for fireworks but not one cent for protection."

On the other hand, the commercial radio and broadcasting engineers consider protection of apparatus and personnel a prime necessity, and a visit to any one of their stations will demonstrate how thoroughly convinced of this they are by the rows of circuit-breakers, relays, fuse blocks, etc. Although the cost of these devices may run into many hundreds of dollars, engineers know that their use will save their initial cost many times over in a short period.

Most amateurs doubtless have gone, or will go, through experiences similar to mine. While in the process of tuning up an oscillator or amplifier, the plate current may suddenly jump to many

times its normal value; or an amplifier, apparently perfectly neutralized, will, in the middle of a QSO, suddenly go into oscillation and heat the elements to the melting point. It may be bias failure or a dozen other things. Or it may easily be as simple a mistake as connecting to the 2500-volt transformer tap instead of the 1500-volt tap, I've done that, too. In all cases, it is pure luck if the plate switch can be pulled in time to save the tube; and I've seen tube after tube relegated to the junk pile because the overload came too quickly. Not only tubes are in danger, but meters, rectifiers, transformers, etc. These accidents happen more often in an amateur transmitter than in a commercial installation because the amateur always strives to work his tubes at the highest efficiency possible, thereby obtaining the greatest output for his money. Often we run the input up to double and triple the rated value because we are obtaining more than normal efficiency and holding the plate dissipation to a safe value.

In September *QST* a process was described whereby an output of 850 watts is secured from a pair of '52's with 4500 volts on the plates and the remarkable efficiency of 85%. Many amateurs would like to duplicate these results and hundreds will make the attempt. But, as the article points out, tuning must be done with extraordinary precautions. As is always the case in highly efficient circuits, a slight maladjustment results in enormous overload on the tubes and associated equipment and many hams who attempt this are going to sacrifice some good equipment. I am not attempting to discourage this kind of work. I am going to try it myself — but not without sufficient protection. Not all of us have the background of experience necessary; and proper protection, obtained at a small cost, will permit us to go ahead with but little apprehension for the safety of our equipment.

High efficiency in amplifiers usually means high biasing voltages and this brings us to another decision in favor of proper protection which will save us money. There is only one way of obtaining high biasing voltages cheaply and that is by the use of grid-circuit resistances or leaks. Unless we have some sort of protection, however, we have an extremely hazardous set-up, so hazardous that very few of us relish the risk. In this system the entire biasing voltage is obtained by the voltage drop through the leak, energy for

* 107 Stearns St., Bristol, Conn.

which is supplied by the excitation provided by the preceding stages. This means that we are staking the safety of our final amplifiers on the 100% performance of the oscillator or other preceding stages. A failure of any one of these means no bias and fireworks. Primary keying may reduce the period of overload in case of failure, but at high efficiencies, things happen fast — and how! Of course, primary keying does not fit in case of 'phone anyway. So, most of us are content to pay the necessary price for a more reliable source of biasing voltage.

I do not believe that I have covered all the arguments in favor of proper protection. I have confined my arguments to those in favor of less destruction, of a saving in transmitter operating expense, and have not mentioned the fact that suitable protection means more hours on the air and less time wasted in waiting for new equipment and reconstruction. However, I think that these will suffice.

Compared with the size of the problem the cure is simple. Most protective devices operate on one of two principles. One is thermal and the other magnetic. Those operating on the thermal principle depend upon the heating effect of the current and are usually intended for circuits in which a prolonged overload of several seconds at least is permissible. While light-circuit fuses have sometimes been used to some advantage, they are invariably slow and none too uniform in operation.¹ They also possess the disadvantage that they must be replaced from time to time at added inconvenience and cost. Such fuses are, however, quite useful in filament circuits and often save the price of a new tube.

This brings us to the magnetic circuit breaker which is the device used universally in all commercial installations. This type uses a magnetic winding placed usually in the plate circuit of the tube between negative high voltage and filament. The winding is of sufficiently low resistance to have a negligible drop in voltage across it. Associated with the magnetic winding is an armature, similar to that of a relay, and some sort of a spring operated switch. The action of the armature serves to trip the switch, the idea being shown in Fig. 1. The magnetic breaker is usually calibrated by providing means for setting the armature at various distances from the magnetic coil. In actual practice, the breaker is set to trip at a plate current value slightly above the safe value at which the tube may be operated continuously. The coil terminals are connected in series with the plate circuit between negative high voltage and filament, as mentioned before. The terminals pro-

vided for the "switch" portion of the breaker are connected in the primary of the plate transformer. Now, as long as the plate current remains at a safe value, the primary circuit is closed and we operate as normally. But the instant an irregularity occurs, whether we are aware of it or not, the plate current flowing through the magnetic coil becomes sufficient to draw the armature and this trips the spring-operated switch and opens the primary of the plate transformer in a fraction of a second — before much, if any, damage can be done. As soon as the trouble has been cleared, the breaker may be reset by simply pushing a button or pulling a handle provided for the purpose, which again closes the primary circuit.

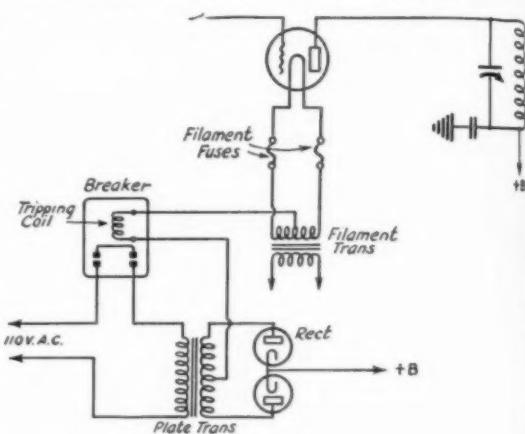


FIG. 1.

The action of the magnetic breaker is many times faster than any thermal operated device.

Thus, it is obvious that we have a kind of electrical watch-dog which constantly keeps an eye on the color of the plate for us and relieves us of all worries for the safety of our equipment. We can try new circuits, 100% modulation, use automatic or leak bias, and even forget to use a proper plate voltage, and still be able to save most of the equipment from disaster.

As an example of the saving which proper protection will involve, I will mention an experience on record at station W9EK-XH at Madison, Wis. This station was in regular operation over a period of five years. Among the various transmitters designed, constructed and operated, there were three crystal-controlled transmitters, each running a Type '04-A in the output stage. During the first few months of testing and experimenting, in spite of our utmost precautions, numerous casualties occurred which included one of the prized '04-A's. In view of this last loss, it was decided to purchase a couple magnetic circuit-breakers. The type purchased was of the variety which breaks the high voltage d.c. directly and their

¹ Not to be confused with ordinary fuses are the special high-speed high-voltage type fuses intended for protecting meters and tubes.—EDTOR.

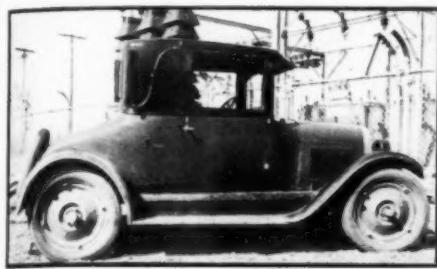
(Continued on page 88)

Running Down Local QRM

By Robert B. Witschen, W9SV*

OCCASIONALLY we read of some ham who has a chronic case of power leak in his vicinity. Having been in the interference business for quite a number of years, I would like to give some light on the subject that never seems to have come out in print.

A lot is said about how to stop interference, but very little is mentioned about finding it without the use of fancy gadgets with high falutin' intensity meters. Or, maybe most of us



THE INTERFERENCE-LOCATING CAR GUIDED TO AN OUTDOOR SUBSTATION
These installations are likely sources of "local QRM."

think that a loop set is needed. Well, let's say here that intensity meters are OK but not at all necessary, and that the farther one keeps from a portable loop the better. There is only one place for the loop set and that is for locating high-line QRM. So if you have no nearby high tension lines, then just forget about the loop set.

Here's the dope. Get out the portable ham receiver. A two-tube ham receiver with ear phones and very little sock is just right. This is to be used for finishing the work when within fifty feet or so of the source of interference. But it is not used until the area has been definitely located. The reason that the little portable set is stressed at the start is to enable you to finish where you would otherwise give up the chase.

Now for the main and important part. It's a regular automobile radio. Some ham or friend perhaps has one, and usually has noise too, so is willing to help. Try to get a car radio that reproduces the high notes well, because the noise is much more pronounced on such a set. The next thing, a point generally overlooked, is to fix in mind that *at the source* the QRM is of "universal" wavelength. In other words, if the b.c. set shows little or none of the QRM that is heard on short waves, it indicates that the source is some distance away.

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Now get the car radio going, and if you cannot hear the same noise that you hear on short waves (very unlikely) go to some suspected power lines until the noise is definitely heard and identified. Then *don't* do this: End up where it is loudest. You might drive for miles and find it loudest at the end of a line, perhaps a mile from the source, and miss the source entirely. This can happen even with an intensity meter. (Hi.) Remember the universal wavelength effect and, instead of keeping the dial at the loudest point of reception of noise, just detune from this point until the noise is barely audible. Try the other side of the peak, too, and check the width of dial tuning range blanketed by the noise. As you drive there will be noticed quite a number of dead spots where the noise will suddenly disappear and then rise to normal. After these are passed, check again — and if the dial blanketing is narrower for the same intensity, then change your course until the noise is effective over a wider area of tuning. Keep the noise intensity as low as possible, using the volume control, until in driving

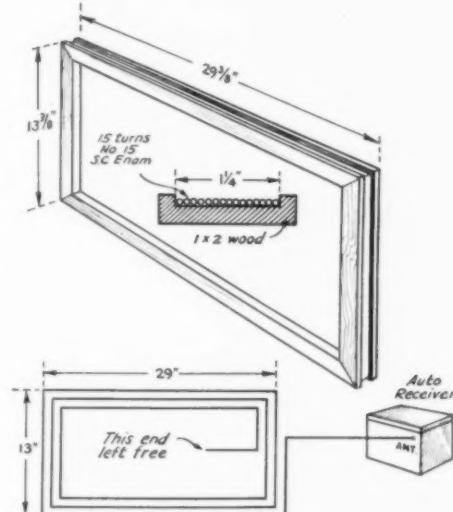


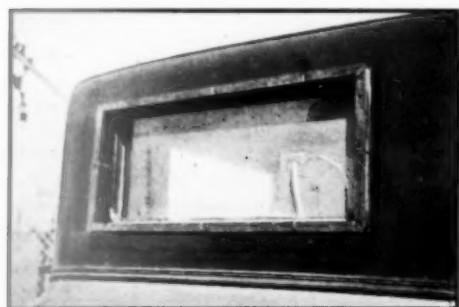
FIG. 1 — THE LOOP USED FOR LOCATING INTERFERENCE FROM HIGH LINES

Mounted on the rear of the car, framing the rear window, it is normally at right angles to a line paralleling the highway.

a spot is reached where the dial is completely blanketed and no detuning can avoid QRM. Now the trail ends and not more than an hour should have elapsed on the first trial.

If you are out in the open near a pole having a transformer, try hitting the pole with a big rock or heavy wooden mallet. If the radio emits squawks in tune with the thumps, get a power man to climb the pole for loose wires and fuses or corroded lightning arresters. Shaking the guy wires will do the same thing, but it is hard to pick out the exact pole, since the whole system will be in vibration. But even this is enlightening.

In the event the noise comes from some appliance, get out the portable, attach about two feet of stiff wire to the grid end of the coil for aerial (20-meter coil OK) and you will be able to finish the job on the intensity principal. (Here we have the universal wavelength effect again.) In resi-



THE LOOP FOR LOCATING HIGH-LINE INTERFERENCE FRAMES THE REAR WINDOW OF THE COUPE

dences it may be better to get permission to check fuses, screwing them in and out to switch circuits on and off, and have a partner in the car blow the horn for the "off" signal when the noise quits.

For high-tension work use a good loop set. Keep the loop at right angles to the spans and every pole showing noise will give off a "buzz" without you hearing the noise of the whole line. Defective insulators are rare. Loose hardware is noisy (induction) and can be detected or temporarily stopped by tapping the pole with a wooden mallet.

The writer is using an aerial for the car radio that looks like a loop, but is only such when the receiver is tuned to the natural period of the loop. It is mounted permanently at right angles to the line of travel, being built around the rear window of the coupe. In order to get loop action in this way, one end of the winding is left free and the other goes to the aerial post of the radio (Fig. 1). The conventional ground is retained on the receiver, and this aerial gives good volume for all purposes. What the designers of short-wave converters have been trying to avoid in the resonance effects of unused inductances is used to advantage in this case.

To those seriously minded in this work, it may be stated that the loop contains 15 turns of No. 15 s.c. enameled wire in a groove $1\frac{1}{4}$ inch

wide, size of the frame being 29×13 inches. The b.c. receiver chosen was a Silver-Marshall auto set because of its ability to bring out the highs extremely well. Resonance with this combination appears at about 1200 kc. A commercial portable was discarded for the final "touch-up" work in favor of the portable described in August, 1931 *QST* — thanks to W9CH.

Standard Frequency Transmissions

Date	Schedule	Station
Nov. 2, Wednesday	B BB	W1XP W9XAN
Nov. 4, Friday	BB A	W6XX W9XAN
Nov. 5, Saturday	BX	W6XX
Nov. 6, Sunday	C	W6XX
Nov. 11, Friday	A	W6XX
Nov. 13, Sunday	C	W1XP
Nov. 16, Wednesday	A	W1XP
Nov. 18, Friday	B B	W9XAN W6XX
Nov. 23, Wednesday	BB C	W1XP W9XAN
Nov. 25, Friday	B A	W9XAN W6XX
Nov. 30, Wednesday	B BB	W1XP W9XAN
Dec. 2, Friday	BB A	W9XAN W6XX
Dec. 3, Saturday	BX	W6XX
Dec. 4, Sunday	C	W6XX
Dec. 9, Friday	A	W6XX
Dec. 11, Sunday	C	W1XP
Dec. 14, Wednesday	A	W1XP
Dec. 16, Friday	B B	W9XAN W6XX
Dec. 21, Wednesday	BB C	W1XP W9XAN
Dec. 23, Friday	B A	W9XAN W6XX
Dec. 28, Wednesday	B BB	W1XP W9XAN
Dec. 30, Friday	BB A	W6XX W9XAN
Dec. 31, Saturday	BX	W6XX

STANDARD FREQUENCY SCHEDULES

Time (p.m.)	Evening		Time (p.m.)	Afternoon	
	Sched. A	Freq. (kc.) B		Sched. BB	Freq. (kc.) C
8:00	3500	7000	4:00	7000	14,000
8:08	3600	7100	4:08	7100	14,100
8:16	3700	7200	4:16	7200	14,200
8:24	3800	7300	4:24	7300	14,300
8:32	3900		4:32		14,400
8:40	4000				
Time (a.m.)	Morning		Time (a.m.)	Morning	
	Sched. BX	Freq. (kc.) BX		Sched. BX	Freq. (kc.) BX
6:00	7000		6:00	7000	
6:08	7100		6:08	7100	
6:16	7200		6:16	7200	
6:24	7300		6:24	7300	

The time specified in the schedules is local standard time at the transmitting station. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XX, Pacific Standard Time.

(Continued on page 84)

The Single-Signal Receiver at Work

C.W. Reception 97% QRM-Free at W1MK—Low-Power Signals Brought to High-Power Level—More Ideas for Construction

TIME and experience try the real worth of anything new. This applies particularly to the realm of technical development, especially to that of radio. Some months have elapsed now since the single-signal receiver graduated from the *QST* laboratory and was given its baptism of fire under practical amateur traffic conditions in the League headquarters' station W1MK. Previous months of development and testing under laboratory conditions had given a pretty fair idea of what might be expected in the way of performance. But here was something that represented a revolution in high-frequency receivers, not only in basic theory but also in circuit detail and construction. Practically every previously accepted standard feature of high-frequency receiver design had been thrown overboard and a brand-new start from scratch had been made.

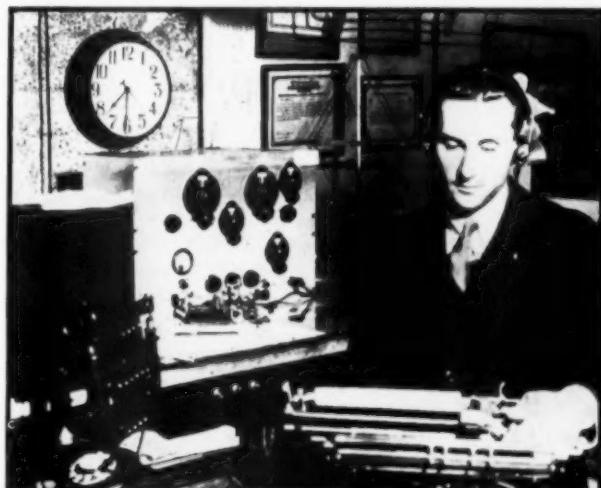
True enough, exhaustive laboratory tests had failed to show up anything in the nature of a basic fault. But what might develop in rigorous day-to-day service of scheduled traffic handling? How would it react to operation right alongside a pair of 500-watt transmitters? How would it cope with those QRM and QRN situations that never show up in casual reception but inevitably occur when important traffic is at stake? How would it "wear" after the usual first enthusiasm for something new had passed? Although confident that the single-signal receiver would work a large degree of improvement over the best-of-their-kind receivers that had previously held sway, we had to try it to find out just what the measure of the improvement might be. Headquarters' station W1MK offered an ideal tough spot for the test. And here is Chief Operator Parmenter's report covering the first month's service.

Traffic Handling With the S.S. Receiver

By R. B. Parmenter, W1MK

THE original model of the single-signal receiver, described in *QST* for July and August, has been used for all work at W1MK since August 23d and it certainly has proved to be a

knock-out. After a few nights of tuning around and making comparisons of the three i.f. filter connections, it was decided that the straight superhet connection (crystal shorted) would be useful for 'phone reception when QRM was not too bad and that the more selective parallel connection was most satisfactory for 'phone reception in bad QRM. But for c.w. use with all types of signals and under all conditions, the series filter connection proved to be by far the best. The "broad" setting of the selectivity control makes a fine stand-by position, while slight readjustment of this control makes available any degree of greater selectivity up to the maximum peak of the "sharp" position, as QRM and back-



SOLID COPY ON A MILL AND NEGLIGIBLE INTERFERENCE PREVAIL AT W1MK SINCE THE INSTALLATION OF THE SINGLE-SIGNAL RECEIVER

Here we have "RP" at work, with the new receiver on the operating table (under the clock).

ground noise may require. Relatively few cases demand the use of the maximum selectivity, however.

BREAK-IN OPERATION AND STABILITY

Quite a few surprising things have been accomplished with the s.s. receiver that have never been possible with any other type. For instance, either of the 500-watt transmitters can be monitored with the receiver tuned smack-on the fundamental frequencies, even with a 135-foot receiving antenna connected, and still no blocking occurs. The gain control is set so that there is no

damage to the tubes or ear drums, of course. Best of all, break-in operation has been made possible to within beat-note of the fundamental of the 3500-kc. self-excited transmitter and right up to the output frequency of the 7.0- and 14-mc. crystal-controlled transmitter with its oscillator and three stages running continuously. Nothing like this had ever been possible with the receivers previously used — and no wonder, with the receiver position but inches away from both transmitters and the receiving antenna lead-in of necessity running parallel to and 6 inches from the transmitting feeders. All that is needed for perfect break-in on any band is better separation between the receiver and transmitters, and shielded antenna leads to the receiver.

The all-around stability that is characteristic of this receiver, its ability to hang onto a steady signal without continuous retuning, together with its high selectivity, have made the use of a "mill" for copying traffic the rule rather than the exception. Needless to say it is a great convenience to take strings of five messages and more directly on the typewriter instead of scribbling them long-hand and then recopying on a "mill" for delivery. Any signal having a semblance of stability will stay put as far as the receiver is concerned.

QRM AND QRN

In hundreds of QSO's very little QRM has been experienced, not over three or four cases in which it has been impossible to copy our man. Needless to say these exceptions have occurred where the interference was of identically the same frequency as that of the station being worked. What a contrast to the interference previously experienced. *The log shows that with this receiver QRM-free reception has been boosted to some 97%.* When the receiver is used with the series filter connection natural QRN is decreased remarkably and local QRN of all kinds becomes practically nonexistent, as does a.c. induction from any source. (Anyone building the receiver without the crystal i.f. filter is making a big mistake.)

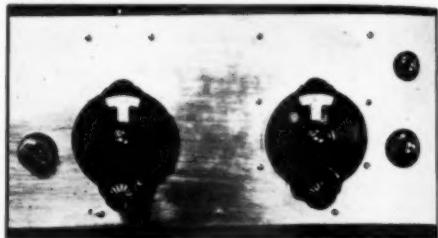
EFFECTIVE SENSITIVITY

As an example of the effective sensitivity, in routine operation it is not unusual for us to receive from schedule stations "QSA3 R4" reports on our 500-watt signals on nights when skip effects are bad — and to have the other fellow a thousand miles off with his pair of '45's come rolling in "QSA4 R8." This has happened on so many occasions that we have become reconciled to the seeming superiority of the low-power outfits. It is accounted for, of course, by the high sensitivity and low background noise level of the receiver which, combined with its exceptional stability and selectivity, make all signals stand out. There have been any number of cases in which we have copied message after message

without a miss from a lower-powered station while he, using an ordinary receiver, has been unable to get a thing from us but "OK." The receiver makes all the difference.

EASE OF CONTROL

Although one might get the impression that this model is difficult to tune, the exact contrary is actually the case. The tuning itself is actually "one-hand." The additional panel controls are completely independent of each other, unlike the interlocking controls common to most receivers, and each makes its contribution to the



THE CONTROL PANEL OF W3ZF'S MODEL OF THE S.S. RECEIVER

The large dials are for r.f.-detector tuning (left) and h.f. oscillator (right). The knobs are for antenna trimmer (left), filter switch (upper right) and selectivity control (lower right).

receiver's exceptional performance. The precise tuning is all done with the oscillator dial, the r.f.-detector tuning dial simply being "tracked along." The antenna trimmer condenser is touched only when coils are changed, with the audio-beat, selectivity and gain controls coming into play only occasionally, as the receiving conditions may require. (Anyway, what real ham ever had a "single-control" receiver that he was satisfied to leave that way? To get the most out of it a couple of extra knobs always have to be added.)

Every one of the many hams (and commercial people, too) who have visited W1MK to see and hear the receiver in operation have been enthusiastic about its performance. Even the skeptics have been converted. The receiver appeals especially to the operator of the high-power class of transmitter because, although he can often crash through the QRM, he has difficulty in copying signals from the lesser-powered stations who try to work him. It seems to me that anyone who has achieved a multi-stage transmitter certainly ought to have an s.s. receiver to go with it.

OTHER DEVELOPMENTS

So much for the report of "RP" of W1MK. Now let's take a look farther afield and see what others are doing with the single-signal receiver. One noticeable consequence of its introduction is the stimulation of new designs in the commercial field. Several commercial organizations

are preparing to manufacture the complete receiver, we have been informed, while others prominent in the field have adopted one or more of its features, particularly the electron-coupled high-frequency and audio-beat oscillators, developments first applied to superhets in the *QST* laboratory and first described in *QST*. Several amateurs have modernized their commercially built short-wave supers by converting them to s.s. rigs and a number have built and are using models based on the original. Among the latter is W3ZF-W3CGI, who passes on the dope on his version of the high-frequency and i.f. filter unit that he is using with a b.c. chassis for the i.f. and second detector unit.

The Single-Signal Super in Another Dress

By Don L. Lusk, W3ZF-W3CGI

IN THE August, 1932, issue of *QST* James J. Lamb described the essentials of a single-signal superheterodyne, which has created a multitude of requests for more information on how to build it. This article is not intended to be a theoretical discussion of this circuit or apparatus, but merely a description of another method of construction, incorporating the desirable features pointed out in the above articles. In this version of the high radio-frequency and i.f. filter unit some of the trimmings have been left over till after the depression, or until such time as further experiments are made. Getting right down to business we start at the front end.

RADIO-FREQUENCY PRE-SELECTOR STAGE

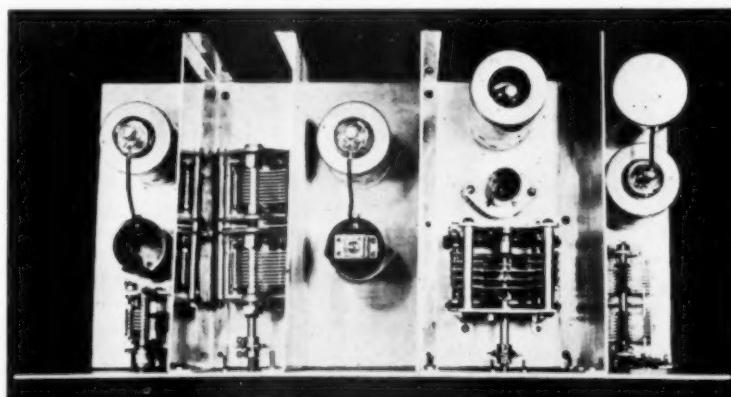
This is essentially as described by Lamb with the exception

that the grid-bias circuit decoupling feature has been omitted, eliminating R_4 and C_5 of Fig. 3 in the August *QST* article. This stage is extremely well shielded. There are two reasons why this should be most complete. First, if oscillation occurred here it would defeat the purpose of our oscillator stage, in addition to allowing all sorts of squeals and what-not to be passed on to the i.f. stages. Also, shielding is

particularly desirable because we want the signals to come into the set only one way, from the antenna through the pre-selector circuits. This stage uses a Type 58 tube, operating with 200 volts on its plate and approximately 90 volts screen. The output of this stage is run through a special shielded wire, having a large diameter and low capacity to ground, into the first detector.

This stage is wired as shown in the August article, with the exception that here again we left off the grid-bias circuit decoupling feature, eliminating condenser C_3 and resistor R_4 of the original circuit. This stage uses another Type 58 tube, the output of which is fed through the special shielded wire to the i.f. filter.

The filter stage contains a standard Litz-wound 465 to 525-kc. i.f. transformer whose two padding condensers are disconnected from shunting the coils and are used as the balancing condenser in the crystal circuit (C_{15}). This stage is peaked to a frequency of 500 kc., as is the frequency of the special crystal. The crystal is not of the usual power type variety, but is made especially to use a low-capacity air-gap crystal holder. The crystal itself is not much larger than about the size of a dime. It can be either round or square. There seems to be no particular advantage in



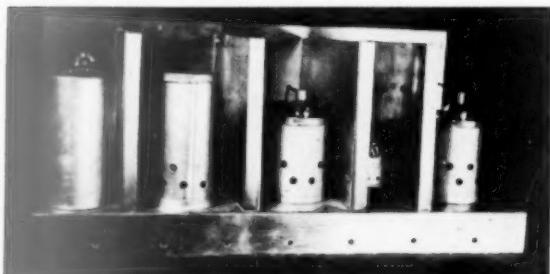
TOP VIEW OF THE W3ZF RIG WITH PART OF SHIELDING REMOVED

The r.f. and first detector tuning condensers are between the compartment housing the trimmer, coil and tube of the r.f. stage (extreme left), and that of the first detector coil and tube. To the right of the detector is the h.f. oscillator, with the i.f. filter (including the first i.f. amplifier tube) at the extreme right.

having a power type crystal here, since it serves only as a filter.¹ This particular holder was made by the Chase Instrument Co., of Philadelphia. The dual 140- μ fd. tuning condenser is con-

¹ Tests with the original model showed that the larger crystals (approximately 1 inch square) were more responsive and hence gave greater receiver sensitivity than the miniature "chip" type. The smaller crystal might account for the necessity of using additional amplification. — EDITOR.

ected across the secondary of the i.f. transformer, and a three-position inductance switch selects "Series," "Parallel" or "Off" connection of the i.f. filter, permitting variations in selectivity to suit requirements. When the switch is thrown in the "Off" position, the receiver can be considered as a straight modern superheterodyne. One change was made in this circuit. A Type 58 tube was incorporated here as the first i.f. amplifier to provide greater r.f. gain and to prevent



REAR VIEW, SHOWING HOW THE BASE-PLATE IS BENT TO FORM THE SUB-BASE REGION THAT HOUSES CHOKES, BY-PASS CONDENSERS, ETC.

signal loss which might be likely if we ran the output from the i.f. filter to the grid of the i.f. tube in a separate intermediate-frequency amplifier unit. This I believe to be an improvement over the original design, if a b.c. receiver chassis is to furnish the i.f. amplifier.¹

THE HIGH-FREQUENCY OSCILLATOR

This is designed to permit "logged" tuning, using plug-in coils. As mentioned before the cost of the unit had to be kept down, and since "midget" four-prong coil forms were on hand and the coil-switching rig required considerable labor for its installation, it was decided to use plug-in coils. Since we were interested only in the amateur frequencies, we decided that another method of band spreading would be more desirable. A General Radio Type 556 band-spread condenser was pulled out of the old dynatron frequency meter and was made to do double duty in the new receiver. We reasoned thus: If the electron-coupled oscillator is the latest in frequency meters, why couldn't we use this arrangement as both the calibrated high-frequency oscillator for the super and as a frequency meter, and thereby do away with the old dynatron idea? It works out FB except that there must be a difference between the oscillator frequency and the incoming one. That is, suppose we were receiving W1XP on 4000 kc. Our oscillator is actually 500 kilocycles higher in frequency or on 4500 kc., the difference equivalent to the resonance frequency of the i.f. unit. But we were not interested in measuring the frequency of our oscillator, we were interested

in measuring the incoming signal frequency, which is still 4000 kc. Simple, if you do it right.

A word about the stability of the electron-coupled oscillator may not be amiss. The receiver, after it was completed, was tuned for two hours to the frequency of WWV on 5000 kc. (the Bureau states that their accuracy is better than one part in five million) with no noticeable variation frequency over the entire period. Of course, the set was warmed up for about a half-hour before the transmission. Also, we might just as well put up our argument here against too much band spread. Because of the extreme selectivity of this receiver it is not advisable to spread the bands too much, since it would take too long to tune from one end of the band to the other in fishing for answers to CQ's. Of course if you never send out this little "demon," why then spread the tuning as much as you like. No doubt there are a lot of arguments "pro" and "con" on this subject, so we are content to let you decide yourself. You will note from the picture that the oscillator tuning condenser is screwed to the base and that an insulated flexible coupling is used between this and the tuning dial,

thereby eliminating frequency fluctuations due to vibrations in the front panel, etc., and making the assembly more rigid. Extreme care should also be exercised in the shielding of this stage. If r.f. leaks out, it might cause undesirable couplings to other parts of the receiver. A little extra "doping" here and there will result in improved stability and a receiver that you can truthfully be proud to own.

Adjusting and tuning up the receiver after construction has been completed is exactly as has been already fully explained and the reader is referred to the original article for the data. A good high-frequency signal generator (commonly known as an aligning oscillator) is an asset, however, as is also an output meter which will enable you to peak every circuit to exact resonance without guessing.

THE RESULTS OBTAINED

The performance of this receiver is really astonishing. It truly is a revelation. Signals that cannot be touched with an ordinary super can be picked up and read with perfect ease with this instrument. And because of its single-signal selectivity the old band doesn't sound half so crowded.

"What is single-signal reception?" a number of fellows ask. The answer is that instead of hearing each c.w. signal twice as is customary with the ordinary receiver, you hear it only once. In other words, as you tune into a c.w. signal it is of high pitch and, with gradual tuning in the

(Continued on page 90)

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Third All-Section Sweepstakes Contest

November 12th to 21st—No Advance Entries Required—All W, K, KA, CM, VO and VE Hams Invited—Simplified Rules—Just Take Part and Report—
69 Operators Can Win—New Bronze and Gold A.R.R.L. Awards—
Come on In, OM—Enjoyment Guaranteed

By F. E. Handy, Communications Manager

NINE full days of operating enjoyment, including two whole week-ends! Any ham with an amateur station who lives in the U. S. A.¹ or Canada can take part.

The whole idea of the contest is this. Each station gets on the air as much as possible during the contest period. As many stations are "worked" as possible. A message must be exchanged as necessary proof of "solid" QSO. In working stations the idea of working as many different A.R.R.L. Sections² as possible is also kept in mind.

KEEPING SCORE

Each message received, counts one; each message sent, likewise, counts one. Each station you work can contribute a possible addition of two points to your score. At least one message must be handled³ between the two stations before any entry may be added or score claimed. A message in each direction must be exchanged to get the maximum possible count of "two" in the course of a QSO.⁴ (Additional messages may be handled during each QSO of course, but add no more to the score.)

As contacts are made and a score built up, you keep a list of stations, their location or A.R.R.L. Section, and the number of points for each QSO. At the end of the contest all these points are added up. Then count the number of different A.R.R.L. Sections² worked with which at least one message has been handled, and multiply the sum of your points with individual stations by this number. Since the A.R.R.L.'s field organization has 69 Sections,² that number is the greatest possible multiplier. After the first bunch of QSO's the score mounts with amazing rapidity and makes it extremely interesting to keep score and com-



pare scores. Keep the summary of your score in the form given with this announcement, listing the names of all operators⁵ at your station whose work is responsible for any part of the score indicated in your "summary."

THE GENERAL CALL

"CQ SS CQ SS CQ SS de W . . . W . . ." is suggested as a special call to indicate stations looking for contacts during the Sweepstakes contest. During the active operating hours we feel sure a single snappy "CQ SS" will bring results!

THE MESSAGES

Messages are to be transmitted in complete A.R.R.L. form with city of origin, number, date, address, text and signature, the text being of ten or more words by plain language count where messages are made up for the purposes of this activity. Many messages in our contest may be "originated and delivered," addressed to the station being contacted. However, when regular routine traffic happens to be in need of routing in a particular direction for delivery or further relaying it should be handled and held with the rest of the message file, to be submitted if called for, following the report of work in the contest. Routine traffic may be counted regardless of the length of the text. There is no excuse for routing messages in the wrong direction unless it is learned that a station can forward them by

¹ Including Cuba, Porto Rico, Hawaii, Alaska, P. I., etc. Amateurs in Newfoundland are included in the Maritime Section of the A.R.R.L. field organization.

² See the complete list of Sections in the A.R.R.L. organization, page 5 of this issue of *QST*.

³ "Handling" a message always includes the transmission and receipt of radio acknowledgment (QSL) of same, and the entry of date, time and station call on the traffic, as handled, for purposes of record. All messages should be handled in standard A.R.R.L. form.

⁴ There is no point in working the same station more than once in the contest period if 2 points have been earned by exchanging messages. If but one point is made the first time a station is worked you can add a point by working this station again and handling a message in the opposite direction.

⁵ The highest individually-attained score of any one of the operators of amateur stations having more than one operator is the official score for such a station. The summary of score must show all stations worked by all operators however, underlining or circling the entries of stations and/or Sections that cannot count in the official total. Awards will be based on the official total and will be made to the individual operator accredited with this total. To show the possible scores that can be built up by several operators at one station, such scores (all Sections listed by all points listed) may be shown parenthetically after the "official" score that counts toward a possible award.

schedules or traffic routes though. *Message files must be kept*, and in the cases of the winners in each Section or any special question that the committee on awards could answer by reference to your file, operators will be called upon to send Hdq. their contest traffic for examination and return. Failure to provide traffic files if called upon to do so will constitute disqualification. However, participants are not requested to send in message files with their reports, but merely to hold them for possible call. It is believed that this arrangement will make possible a saving of work and expense as well as simplify the arrangements for those who take part.

Message form is explained in detail in the Seventeenth Edition of the "Rules and Regulations of the Communications Department." (This booklet also contains the Federal Radio Commission regulations for amateur stations, Q Code, International Prefixes, a large photograph of W1MK and other information. On receipt of a postal to A.R.R.L. requesting this publication it will be sent free of charge if you state that you want the information in connection with the Sweepstakes contest.) In all cases in which Sections are smaller units than states, the name of the Section should be included after the signature in originated messages to assist participants in properly crediting messages.

An example of amateur message in A.R.R.L. form follows:

*Hr msg fm San Jose Calif W6FBW NR 382 NOV 14
To Bill Harrison W1VS
85 Mystic St
West Medford Mass
Can you schedule W9FO Chicago to complete coast to coast
long hop trunk line Santa Clara Valley Section to terminal in
Eastern Massachusetts Section
E J Amarantes
(Santa Clara Valley Section)*

The contest will call for individual originality in making up the messages to be sent to each station worked. Identical-text (so-called rubber stamp) messages must be ruled out of the count of both individual points and Sections worked. As many messages can be sent to a given Section as you can work stations there. All messages for which points are claimed must be handled sometime between the official beginning time and end of our message-handling All-Section Contest. In checking reports points will be deducted for traffic with incomplete preambles, rubber-stamp texts, etc., and this may apply to one or both the stations responsible for haphazard work.

THE CONTEST PERIOD

The exact starting and ending time for our 1932 Sweepstakes is given in the following table for each variety of time in order that there be no misunderstanding. The contest runs from Saturday, November 12th, through Sunday, November 20th (until early Monday, November 21st).

Time	Starts	Ends
A.S.T.	Nov. 12 5:00 a.m.	Nov. 21 5:00 a.m.
E.S.T.	Nov. 12 4:00 a.m.	Nov. 21 4:00 a.m.
C.S.T.	Nov. 12 3:00 a.m.	Nov. 21 3:00 a.m.
M.S.T.	Nov. 12 2:00 a.m.	Nov. 21 2:00 a.m.
P.S.T.	Nov. 12 1:00 a.m.	Nov. 21 1:00 a.m.

IN GENERAL

The word "Sweepstakes" used in connection with our contest signifies "a clean sweep." This is appropriate since our highest scoring stations have literally "swept the air," piling up a great number of points by skilful operating work. The "Sweepstakes" has become one of our most interesting and popular A.R.R.L. activities.

The scope of the contest as has been outlined will indicate its extreme simplicity. For any hams who have ever taken part it is unnecessary to explain the opportunities for making new contacts and friendships between amateurs in each and every League Section, as well as in each and every frequency band. It is of interest to see how many Sections can be worked in the contest period; to determine how many stations can be worked! If you have never tried to work "all Sections," take this as an opportunity to try it. You will add new Sections, and new stations. Any frequency bands can be used.

REPORTING RESULTS TO HQ.

Report to A.R.R.L.⁶ West Hartford, Conn., giving your log or tabulated list of QSO's, showing the Sections, stations, points, and your "grand total" as soon as the contest is over, for credit in the full report of results in *QST*. Include a signed statement that the score and points as enumerated are correct and true to the best of your knowledge and belief. Hold message files for checking but do not send them unless and until called for by Hdq. Use the form suggested herewith in making your report:

New A.R.R.L. Award for Sweepstakes Winners

A newly designed charm bearing a finely worked design symbolic of amateur radio communication and inscribed with the call signal of each winner will be awarded to the victors in this most popular and typical of our A.R.R.L. contests. The design of this emblem is shown herewith (actual size). It gives some idea of the beauty and character of the award, although a black and white reproduction can scarcely do it justice. Awards, where practicable will be made publicly by A.R.R.L. officials and League representatives attending conventions, hamfests and club meetings, and they will be made as soon as practical after the contest is over.

Bronze charms will be given the winner in each Section, except the highest scoring winner in the Canadian portion.

⁶ All competitors are requested to submit their lists, even if they only show a small score, because by doing this they are helping to support the claims made in logs from other stations, and also so they may receive full credit for their work in *QST*.

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of the field organization, as well as the "high man" for all U.S.A. territories, who will receive the same design done in gold. On the reverse of the charm will be a neatly worded inscription, THE AMERICAN RADIO RELAY LEAGUE AWARD — THIRD ALL-SECTION SWEEPSTAKES CONTEST NOV. 1932. Additional lettering will identify the Section in which the winner is resident also. Shall we reserve one of these awards to put with your trophies, or hang on your watch chain?

COMPETITION

The main competition each operator must consider comes from operators in his immediate Section. Section scores will be tabulated too, to see which S.C.M. has the hardest working "team" in proportion to the number of stations in his territory. Work to be high station in your Section, and you may also be "national" high. The awards are primarily for the operator running up the best record for each Section.

OPPORTUNITY EQUAL FOR ALL

In a previous Sweepstakes one of the winners used a 'Q1A transmitter with 180 volts B supply! Power may help but it isn't everything, and this shows the possibilities in every case where there is "real operating" behind the key. In that same contest a 3.5 mc. 'phone ran up a score of over 2500 points. The possibilities of competition between sta-

of operating hours, 'phone or c.w. equipment. All active ham stations are invited to take part and report.

You can't help but work a new bunch of stations, run up some new records for your station, get a new bunch of QSL cards, have a whale of a lot of fun, and perhaps rate an A.R.R.L. award at the conclusion. If you are a newly licensed ham or one who has never majored in "traffic work" you will get some FB operating experience and have a chance to work with a "swell" gang of operators and real friendly fellow hams. The chances have been made as equal as they can be made for all. So put in your best licks at operating and send A.R.R.L. the results for *QST* mention. This will also help the "other fellow" and boost your Section. Here's luck — hop to it.

It is not absolutely necessary that every station you swap messages with be actually taking part in the contest to make your points count. However, logs will be checked and compared with each other by the award committee in as thorough a manner as possible. The message files of leading stations will be examined to insure complete fairness and accuracy of the results and awards. Any neatly kept tabulation in the form given with this announcement will be an acceptable and welcome report. Any operator you work that doesn't know "what it's all about" can be referred to these pages of *QST*. First of all ask the station to come through with a message and take yours.

SUMMARY OF FINAL SCORE

Third All-Section Sweepstakes Contest. Station W VE.....

Date and Time (local)	Station Worked	Freq. Band mc.	City or Town	A.R.R.L. Section	Check if New Section	Traffic ⁷	Points
Nov. 12							
12:08 a.m.	VE2BE	7	St. Lambert, P. Q.	Quebec	x	1-S 1-R	2
12:18 a.m.	W6ZM	3.5	Oakland, Calif.	East Bay	x	1-S	1
Nov. 13							
11:00 a.m.	W5AUW	3.5	Albuquerque, N. M.	New Mexico	x	3-R 1-S	2
12:08 p.m.	W6GAC	3.5	Auburn, Calif.	Sac. Valley	x	1-S 1-R	2
12:25 p.m.	W6AIM	3.5	Marysville, Calif.	Sac. Valley		1-S 1-R	2
12:48 p.m.	W3ASO	14	Washington, D. C.	Md.-Del.-D.C.	x	1-R 2-S	2
1:09 a.m.	VE2AC	14	Thetford Mines, P. Q.	Quebec		1-R 1-S	2
1:29 a.m.	W6ZM*	7	Oakland, Calif.	East Bay		1-R	1
					5 Sections		14

Number and name of operators having a share in above work.....

Score: 14 points \times 5 Sections = 70.

* Marked second QSO's (W6ZM worked twice).

I hereby state that in this contest I have not operated my transmitter outside any of the frequency bands specified on my station license, and also that the score and points set forth in the above summary of my work are correct and true.

(Signed) (Call)

(Address)

QUESTIONS AND ANSWERS ON CONTEST MATTERS

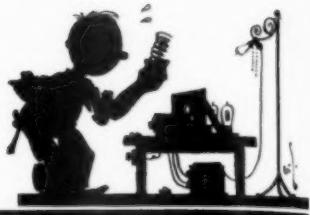
Is it necessary when sending a message which you originate for delivery at a station which you contact, to put in the name, street address, etc., or will the call signal, city and state suffice?

As a general rule, the more complete the address the better. Far too many messages on A.R.R.L. message blanks are re-

(Continued on page 88)

⁷ "Sent" and "received" are indicated as S and R in this summary. When reporting your monthly traffic total to your S.C.M. (as you are invited to do regularly the 16th of each month, although it is not required in connection with this contest) messages should be classified as "originated," "delivered," "relayed" with the sum of the three as your "total" for the Section report in *QST*.

Some Ideas About BAND-SPREADING



A Discussion of the Problem Written Especially for the Junior Operator

ABOTHERSOME necessity which confronts the new amateur who is building his first receiver is that of "band-spreading," which simply means adjusting the tuning circuit of the receiver so that each of the several amateur bands occupies nearly all of the tuning condenser dial. A single tuning condenser with several plug-in coils will not spread each of the bands over the dial properly, because a condenser with a fixed capacity range will tune over a great many more kilocycles at the very high frequencies than it will at the low frequencies. Since the amateur bands vary in width and do not become proportionately larger at the higher frequencies, something must be done to the tuned circuit in the receiver to compensate for the differing number of kilocycles in each band.

Many methods of band-spreading have been devised, but one very simple scheme has not had as much attention from amateurs as it deserves, although used in several manufactured receivers. It is the arrangement in which a variable condenser of fairly large maximum capacity is used in parallel with a very small variable condenser, the large condenser being used as a "band-setting" adjustment and the smaller for the actual tuning. See Fig. 1. This method almost eliminates the "cut-and-try" in making coils, and it has the further advantage that frequencies outside the amateur bands can be picked up, with good tuning spread around practically any frequency to which the large "tank" condenser may be set.

The principle upon which this method operates is not hard to understand, and can be explained quite easily by the example in Fig. 2. Suppose we have a variable condenser whose minimum capacity is $10 \mu\text{fd}$. and maximum capacity $100 \mu\text{fd}$. With a coil of suitable size this condenser will tune over the range given in Fig. 2, which shows the frequency in kilocycles of the coil-condenser combination for different condenser settings. To cover the frequencies between 3500 and 4000 kc., for instance, requires a capacity change of $10 \mu\text{fd}$, since the condenser capacity for 3500 kc. is $40 \mu\text{fd}$. and for 4000 kc. $30 \mu\text{fd}$. Thus, in Fig. 1 if C_2 is set at minimum capacity (plates all out) and C_1 is set at $30 \mu\text{fd}$. then a $10 \mu\text{fd}$. change in C_2 will tune the circuit over the entire 3500-ke. amateur band. If the construction

of C_2 is such that the difference between its maximum and minimum capacities is just $10 \mu\text{fd}$, then the band will be spread over the entire dial on C_2 .

Here is where the curvature of the graph comes into play. If C_1 had been set at $20 \mu\text{fd}$. instead of 30 , the same $10 \mu\text{fd}$. change in C_2 would give a tuning range from 4000 kc. to 4850 kc., or a total coverage of 850 kilocycles as compared with 500 in the first example. On the other hand, if C_1 had been set at $70 \mu\text{fd}$. the tuning range would be 2450 to 2650 kc., or a total of only 200 kc. The greater the capacity used at C_1 , the smaller the tuning range in kilocycles for a given size of condenser at C_2 , and vice versa. Therefore if the tuning coil is of such size that a high-capacity setting of C_1 must be used to tune the circuit to the highest frequency desired, the band-spread will be great; while if a low-capacity setting must be used to tune the circuit to the highest frequency desired, the degree of band-spread will be small — that is, a comparatively small number of dial divisions on C_2 will cover the entire band. By using the right size of coil the desired degree of spread can be obtained on any of the amateur bands despite the fact that the size of C_2 remains constant, which overcomes the difficulty usually experienced in using the same tuning condenser on all bands, as mentioned in our first paragraph.

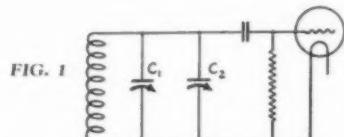


FIG. 1

In using the system, C_1 and C_2 may be two separate variable condensers, C_1 having a maximum capacity of about $100 \mu\text{fd}$. and C_2 about $15 \mu\text{fd}$. allowing $5 \mu\text{fd}$. minimum capacity for the latter condenser so the change in capacity from maximum to minimum will be about $10 \mu\text{fd}$. These specifications need not be followed exactly, however, because the system is more or less flexible and slight differences can be compensated for by alterations of the coil constants. The larger the capacity range covered by C_2 , however, the larger is the "tank" capacity needed at C_1 , so

that if C_2 has a larger capacity range than 10 μfd , it may be necessary to use a condenser at C_1 with a maximum capacity greater than 100 μfd . To get the right range for C_2 it is generally necessary to cut down a midget condenser until there is only one stator and one rotor plate. Special double-section tuning condensers for this method of band-spreading also are available from some manufacturers.

We can give a few specifications on the basis of the condenser capacities mentioned above. Most of the plug-in coil forms are either $1\frac{1}{4}$ or $1\frac{1}{2}$ inches in diameter and about 2 inches long. Allowing room for tickler or antenna windings, the winding space available for the tuning coil will be about $1\frac{1}{2}$ inches. On this basis, then, the coils should be approximately as follows:

Frequency Band	No. of turns $1\frac{1}{4}$ " dia.	No. of turns $1\frac{1}{2}$ " dia.	Length of Winding	Wire Size
1715-2000 kc.	105	90	$1\frac{1}{2}$ inches	28 d.s.c.
3500-4000 kc.	52	45	$1\frac{1}{2}$ "	21 d.s.c.
7000-7300 kc.	15	13	1 "	
14,000-14,400 kc.	7	6	1 "	

In the first two cases the wire size is the largest that can be used to get the required number of turns into the permissible space. Smaller sizes can be used, of course. In all cases space the turns evenly so the length of the coil is that shown in the fourth column; if this is not done the resulting inductance will be widely different from the required value.

To adjust the system, first try the 14,000-ke. coil. Set C_2 at minimum and tune to the high-frequency end of the band with C_1 identifying the frequency by commercial marked stations, amateur stations or a frequency meter. C_1 will be very nearly at maximum capacity. Then tune over the band with C_2 , identifying the low-frequency end in the same way, and note the spread. If it is not great enough, reduce the maximum capacity of C_2 by cutting down the number of plates in the condenser or increasing the spacing between plates (double-spacing), and try again until the desired spread is obtained. If the spread is too great, add a turn or two to the coil and adjust as before. The other bands can be handled in just the same way, except that if the spread is not satisfactory it should be adjusted only by changes in the coil, not in C_2 , remembering that removal of turns from the coil will increase the spread and adding turns will decrease it. The 14,000-ke. tuning should be adjusted first, because it is on this band that the greatest shunt capacity at C_1 is required. If the adjusting is started with the low-frequency coils it may be found that C_1 is not large enough to give the right spread on 14,000 kc. after all the work has been done on

the other bands, which would mean that it would all have to be done over again.

The larger shunt capacity on the 14,000-ke. band, while decreasing the $L-C$ ratio in the tuned circuit somewhat, is helpful especially in oscillating detector circuits in making oscillation steadier. This is a big advantage when the "B" supply is

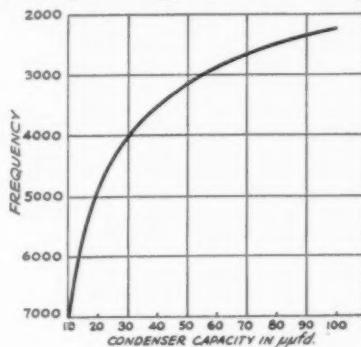


FIG. 2

from an eliminator, because the effect of wavering plate voltage is reduced and the signals have less tendency to "wander." If the builder is satisfied with anything less than full dial-scale band-spread this system is by far the easiest to get into operation, because some degree of spread can be obtained with almost any coil that will tune to the high-frequency end of the band in conjunction with C_1 . Also, the means is at hand to compensate for changes in circuit capacity caused by changing tubes, the effect of the tickler coil, and so on, without its being necessary to rewind the tuning coil, as is so often the case when those systems are used which require a very small tuning capacity.

Strays

From a recent copy of *Collier's*: "Oftentimes when a ship's wireless operator makes a mistake or has an argument with another operator, many others who happen to be listening in give vent to their amusement by jamming the air with the famous radio laugh — two dashes, two dots, two dashes." 'Tis a different world on 600!

About 56-Mc. Work

Circumstances conspired to prevent the publication, this month, of a story on recent five-meter equipment and results. The postponement, however, gives us an opportunity to ask for further data from 56-mc. workers. Brief descriptions of transmitters together with short outlines of results obtained would be of great value in permitting a bumper review of the latest 56-mc. gear and its performance. Drag out the old mill, you birds.

for the

EXPERIMENTER



A Transmitter With Unusual Features

HERE is a brief description of a transmitter that has given exceptional satisfaction for a low-power job, and in which there are two or three details that differ enough from ordinary practice to be of possible help to others.

The set is an m.o.p.a., using a '47 pentode Hartley oscillator, a '47 buffer, and a Type '10 final amplifier. It is used for c.w. work on the 3.5-, 7- and 14-mc., bands, and for 'phone on 3.5 and 14 mc. The oscillator is set permanently on 3500 kc., regardless of the band on which the final amplifier works — a stunt which helps greatly

the contacts of which are normally closed (back-contact relay). When the key is pressed the relay contacts open, thereby taking the fixed condenser out of the circuit. When the key is open and the relay contacts closed, the condenser adds so much capacity to the system that the buffer tank circuit is detuned, with the result that the r.f. is effectively "killed," cutting off the excitation to the last stage. Since the '10 is biased to cut-off or beyond, no plate current flows when the excitation is cut off. The advantages of this scheme are that it permits full break-in operation on 14 and 7 mc., and break-in within a few kilocycles of the operating frequency on 3.5 mc.; the keying is absolutely clickless; and there are no chirps or back-wave.¹

The modulating scheme for 'phone work is also simple and effective, a form of grid-bias modulation being used in which the modulator tube acts as a variable grid leak for the modulated amplifier. This arrangement is also used by several other 14-mc. 'phones, including W5AEJ, W5BRD, W5GA, W5CPC, W8CKC and others. The modulator tube is a Type '01-A. No speech amplifier is necessary.

Resistance bias is used throughout the transmitter, and a separate power supply is used

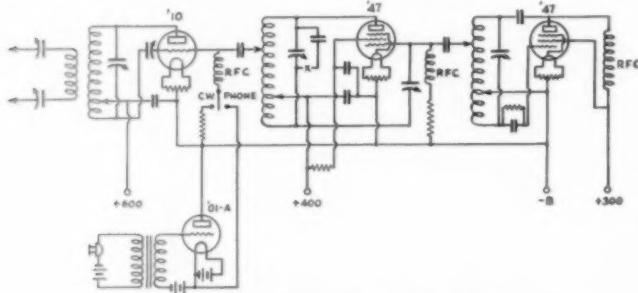


FIG. 1 — W8DRJ'S M.O.P.A. TRANSMITTER

Self-excited pentode oscillator, pentode buffer and frequency multiplier, and a '10 final amplifier. This set works on three bands. The keying relay is inserted at X in the buffer tank circuit. Grid modulation with a Type '01-A tube is used for 'phone work. Values of the various components are the usual ones for the different bands.

in maintaining a very clean and stable signal from the oscillator. The buffer stage works as a straight-through neutralized amplifier on 3.5 mc., as a doubler on 7 mc. and as a quadrupler on 14 mc. Plug-in inductances are used in both this stage and the final amplifier. The input to the '10 in the last stage generally runs between 35 and 40 watts.

The wiring is shown in the diagram, Fig. 1. No constants are given, since the sizes of coils, condensers, etc., do not differ from those used with other sets of similar nature. The oscillator tank circuit should be High-C, of course, but it is best to use a fairly high ratio of L to C in the other two stages.

One of the unique points about the transmitter is the keying system. A .001- μ fd. fixed condenser is connected across the tank tuning condenser of the buffer stage, in series with the keying relay,

for each stage.

Despite the low power, this rig in various forms has worked 83 countries on c.w. and 16 on 'phone.

— Francis J. Cady, W8DRJ

A letter from Roy F. Bennett, W5AEJ, also a user of this system of modulation, describes his method of adjusting it as follows: The modulated

¹ This method of keying is subject to one disadvantage — the plate current on the tube being keyed will rise to values which may be abnormal when the tank circuit is detuned if the excitation from the preceding amplifier is large. So long as this "detuned" plate current is not much greater than the rated plate current for the tube no damage will be done to receiving types such as the '47 and '45, at normal plate voltages. With thoriated-filament tubes such as the Type '10, however, the filament is likely to be deactivated rapidly, even though the "detuned" plate current does not exceed the 60-mil oscillator rating. Oxide-coated filament '10's will be less subject to loss of emission under the same conditions.

— Editor

amplifier is tuned up just as for c.w. work, and the excitation is then reduced until the maximum increase in antenna current is obtained when the microphone is spoken into. Note that this is not the same thing as adjusting for maximum antenna current. W5AEJ uses a Type '01-A to modulate a 211.

It should be pointed out that this modulation scheme is practically the same thing as the method described by Reuben A. Isberg in "Making Practical Use of Grid-Bias Modulation," page 37 August, 1932, *QST*, and is subject to the same limitations as the transformer-coupled system shown in that article. If the modulation percentage is to be high, the power output will be low, considering the power capabilities of the modulated amplifier for straight c.w. It is impossible to obtain both high power output and high modulation percentages simultaneously without introducing a great deal of distortion and probably, also, over-modulation, with resulting spurious side-bands and broadness. These effects, unfortunately, cannot be detected by listening to the quality in an ordinary monitor, nor are distant listeners' reports of much value, since reports of "broadcast quality" are passed out for almost anything that is readily understandable. A vacuum-tube voltmeter such as the "modulometer" described in the *Handbook* should be used to check for overmodulation and to measure percentage of modulation.

Cutting Out Tunable Hums

One annoyance sometimes encountered with home-built "B" supply units for receivers is the so-called "tunable" hum, or hum which appears only when the detector tube is oscillating, and then often at only certain groups of frequencies.

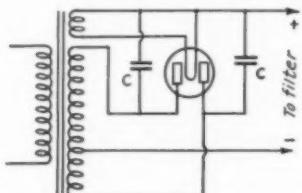


FIG. 2 — FIXED CONDENSERS CONNECTED ACROSS RECTIFIER TUBE ELEMENTS ARE EFFECTIVE IN ELIMINATING TUNABLE HUMS WITH "B" SUBSTITUTES

These hums seem to be unaffected by the amount of filter used, and a "B" supply which shows no trace of hum when used with a non-oscillating receiver frequently is a bad offender in this respect. Again, the hum may be completely absent if the antenna is disconnected from the receiver, only to appear with full strength just as soon as the antenna is hooked on.

A simple scheme which has worked to perfe-

ction in several cases of this kind is shown in Fig. 2. It consists simply in bypassing the elements of the rectifier tube; that is, connecting a condenser of .001-mfd. capacity or thereabouts between each plate and the filament center-tap of the rectifier tube. The capacity used is not critical. Ordinary mica receiving condensers will stand up if the inverse peak voltage across the tube elements is not more than 500 volts.

This scheme has done a good job of eliminating hum when ordinary r.f. filters between the rectifier tube and the input section of the filter failed utterly.

Electronic 'Phone Break-In

Taking a lesson from the Rube Goldberg schemes used on some of the current B.C.L. receivers for intra-channel noise elimination we

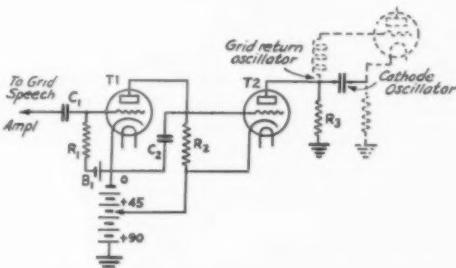


FIG. 3.—CONTROL CIRCUIT FOR 'PHONE BREAK-IN — NO RELAYS REQUIRED

C_1 — .1 μ fd.
 C_2 — 4 μ fd.
 R_1 — .5 megohm.

R_2 , R_3 — 1.0 megohm.
 T_1 , T_2 — Type 56 tubes.
 B_1 — Not less than 4 volts.

emerge with a system for automatic 'phone break-in having no relays and no moving parts.

The system is broadly as follows: A tube T_1 , Fig. 3, is biased beyond plate cut-off until a signal from the speech amplifier releases it. When this occurs its plate current, flowing through R_2 , biases a second tube, T_2 , beyond cut-off. This, in turn, removes the voltage across its plate resistor, R_2 , thereby reducing the polarizing voltage on the grid of the oscillator to nominal operating bias. It sounds complicated but works neatly. The rest of the story is a condenser, C_2 , which provides the "quick advance and slow return" necessary to hold the works in during the interval between words and sentences.

Some details are: The coupling condenser C_1 is connected to the grid of a tube in the speech amplifier which has a normal swing of a few volts. The grid battery, B_1 , is adjusted to a sufficiently large voltage so that the grid of T_1 never goes positive and yet sufficiently small that the audio signal swings it distinctly below the minus four-volt mark.

The condenser C_2 must have low leakage. A good one will show less than .5 microamps when

used as indicated. If, however, it has enough leakage to cause an appreciable voltage across R_2 , it is possible to add a reversed grid battery to tube T_2 so that the net grid voltage is zero when T_1 is removed. The hang-fire device works like this: When the grid bias of T_1 is reduced by the signal, condenser C_2 discharges at a comparatively rapid rate through the tube, but when the tube is again biased high the condenser must recharge through R_2 . This takes a certain length of time which depends on the product of the capacity of C_2 and the resistance of R_2 . For the values shown it takes about four seconds for T_2 to lose 60% of its grid voltage.

The methods of turning off the receiver while the transmitter is on are numerous so this "is left as a problem for the student."

— J. O. Mesa, Waltham, Mass.

Another 'Phone Break-in System

Another break-in system requiring no relays and operating on a similar principle to the one

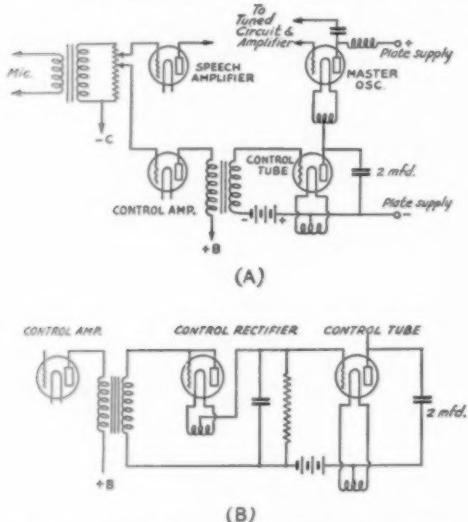


FIG. 4.—MORE 'PHONE BREAK-IN CIRCUITS

The basic circuit is at A. The control tube performs about the same function as the keyer tubes described previously in the Experimenters' Section, but is operated by the speech amplifier. The circuit at B is an improvement over A in that the addition of the rectifier smooths up the operation and acts as a time delay to hold in the transmitter during short pauses in speech.

described above is outlined in the following letter from H. D. Ashlock, W9TD:

"The July issue of *QST* contained descriptions of two interesting break-in 'phone systems. In this connection some of the 'phone gang may be interested in the method used by the General Electric Company for several years to obtain single-frequency duplex operation of their power-line carrier telephones.

"Fig. 4A shows the basic circuit. It will be recognized as the familiar blocking-tube keying circuit arranged for voice control. Fig. 4B is a later development and consists of a rectifier and filter between the control amplifier and the control tube. This circuit gives very smooth operation, and since there are no mechanical relays to introduce lag the operation can be made as rapid as desired by the proper choice of circuit constants.

"Since the plate voltage on the oscillator may vary considerably during modulation because of the drop in the control tube, it would be well to use a master oscillator circuit designed to minimize frequency variation due to plate voltage changes."

The constants in the rectifier circuit of Fig. 4B may be approximately those of C_2-R_2 in Fig. 3. Their sizes will determine the lag during which the carrier remains on after the voice has ceased.

Curing Interference with Telephone Lines

Probably a good many hams, especially operators of 'phones, have had trouble with the land 'phone lines picking up their transmissions and causing interference. Here is an interesting letter from W. H. Carter, Jr., W5ANW, which brings to light a little-suspected cause of such interference:

"The neighbors in the vicinity of W5ANW have been bothered at times with the telephones picking up the transmissions from this station. The telephone company has had several men out here working on the problem and have not been able to correct it. Telephone lines are run by the back of the shack about 7 feet from the transmitter and about 100 feet from the flat-top antenna. Tests were run on this cable, a 51-pair line, and the signal from W5ANW was heard on all of them regardless of how well the cable sheath was grounded. The drops were removed in the tests so that they could not have contributed to the difficulty.

"After the telephone company had given it up as a bad job and were to wait for a man to get back to town to work on the problem, I decided to try a remedy myself. I discovered the cause and correction. The mike on the telephone instrument was acting as a detector and the cable pair was picking up sufficient energy through the lead cover to give a loud signal in the headphone. The trouble can be corrected in three ways: first, by winding a copper cable around the telephone cable and grounding it off at both ends; second, by isolating the telephone disturbed through a repeated coil and furnishing a local mike battery; third (and the easiest method), by simply inserting an aperiodic r.f. choke coil in the 'tip' side of the line at the instrument. This choke can be screwed to the terminal strip in the bell box

and is easy to install. It is not at all critical as to value but if properly designed will completely eliminate *all* interference. The choke *must* be placed in the tip side of the telephone line or it will not be effective.

"I have heard of several cases like this one which were not corrected because the solution could not be discovered."

An Adapter for the SE-143

Many of us in amateur radio have been told that our operating is not as it should be; often it has been suggested that we should listen more on 600 meters where commercial operating is reputed to be at its best. The average amateur has encountered difficulty in building a receiver for this wavelength that is selective enough to exclude the powerful signals of broadcast stations in the adjacent band, or else he doesn't care to spend the money to build such a set.

This station, because of its activity in the Navy Volunteer Communication Reserve, was loaned an SE-143 receiver. This receiver is equipped with a crystal detector, with provision made for a vacuum-tube detector to be added externally. After fussing around with batteries and building detectors, mostly of the 201-A variety, and having no real success with any of them, the set was stowed away.

One day the op had the happy thought of taking four leads off the SE-143, the filament, grid, and two plate leads, placing them in an adapter plug and plugging into the detector coil socket of the short-wave receiver used in this station. This receiver has an untuned r.f. stage using a '35 tube, a '35 regenerative detector, and two stages of audio. The short-wave receiver was connected normally to its antenna-ground system. The SE-143 was connected to an antenna independent of the short-wave receiving antenna, but to the same ground. The antenna and grid circuits of the SE-143 were coupled loosely, about 40 on the inductive coupler scale, and the antenna series condenser turned to nearly maximum capacity. The grid tuning condenser was next tuned to 600 meters and then the tickler coupling tightened until the detector slide into oscillation. What a surprise! Six hundred came to life in a big way, and how those sigs poured in! The results obtained were beyond the fondest hopes. Loudspeaker only was used, and at night, WAX, WPA, WNU, WOE and numerous other coast and ship stations came in R9 plus. The '35 oscillates smoothly, with no backlash, grunting or fringe howl over the whole wavelength range of the receiver. No interference is experienced from nearby broadcast stations.

With the necessity of building a detector and audio system eliminated, and no batteries to fool with — just four leads and an adapter plug

to suit your short-wave receiver coil socket — the SE-143 is made practical for the amateur.

— J. E. Ploucher, W3BRB

The same idea can be applied to other similar receivers, no doubt with equal success. A great many amateurs own government surplus Signal Corps and Navy sets covering the range between 250 and 2500 meters, a large number of which are not being used just because of the bother of building detector and amplifier equipment to go with them. This simple scheme is certainly worth a trial.

— Editor

Strays

The liquid sold by the Kresge stores under the name of "Krome Plate" makes copper tubing inductances look very pretty and also is FB for the brass plates in the crystal holder.

— W3BRY

PHOTO-STAMPS FOR QSL'S

Hams who like to have photographs of themselves on their QSL cards will be interested to know that it is possible to obtain miniature photographs in postage-stamp form which can be stuck on the card or other correspondence without the expense attendant upon the making of a regular half-tone and the necessary printing. The pictures are printed photographically and are therefore extremely clear and sharp, even though the size is small, and can be made from any type of photograph. The stamps can be procured from the Photo-Stamp Company, Girard Trust Building, Philadelphia, Pa.

W8XK in New Location

With license for power up to 40 kw., W8XK is now occupying four high-frequency channels and operating at Saxonburg, Pa., right alongside its "low-frequency" big brother KDKA. In addition to the former frequencies of 6140 kc. (48 meters) and 11,870 kc. (24 meters), frequencies of 15,210 kc. (19 meters) and 21,540 kc. (13 meters) are now being used by new short-wave transmitting equipment installed at the Saxonburg plant. Placing the whole works under one roof has made possible the common use of much equipment by both the standard broadcast transmitter and the high-frequency outfits. The official daily schedule of W8XK is now as follows:

Frequency (kc.)	Time	
	E.S.T.	G.M.T.
6,140	4:00 p.m.—Sign-off	2100—Sign-off
11,870	3:00 p.m.—9:00 p.m.	2000—0200
15,210	6:30 a.m.—4:00 p.m.	1130—2100
21,540	6:30 a.m.—11:00 a.m.	1130—1600

Amateur Radio STATIONS

W9DCX, Chicago, Ill.



FRANK L. BRITTIN, 1409 Rosemont Ave., Chicago, is the owner of the fine-looking outfit shown on this page. W9DCX is a combined e.w.-'phone station, working on 3625 kc. for e.w. and 3945 kc. 'phone.

The large vertical panel on the table at the right contains the 210 crystal oscillator, temperature controlled (the temperature-control box projects from the side to the right about halfway up), an 865 buffer amplifier, a 203-A modulated amplifier, and two 545's in parallel as modulators. The power supply for the oscillator is housed in the base. The output of the 203-A is fed to the linear amplifier, a DeForest 571, a 750-watt three-element tube, which is mounted on the front of the unit which appears at the left of the table. In the upper portion of this unit is the tuning equipment for the 571 stage, while the lower part is occupied by the rectifier and filter for the high-voltage supply. Four 572 mercury-vapor tubes in a bridge circuit comprise the rectifier. The filter has two 750-mil chokes and three 3000-volt oil-filled condensers.

Between the two transmitter panels is the receiver, an a.c. job using a 235 tuned r.f.

stage, 235 detector, 227 first audio and 245 second audio. Just above the receiver is the output amplifier used for c.w. An 860 is used in this stage.

The speech amplifier is housed in a separate cabinet about ten feet from the transmitter, and is not shown in the photograph. It has two stages of 227 amplifiers and a third stage with two '47's in push-pull. The output is matched to a transmission line connecting the speech amplifier and modulator, and a line-to-grid transformer and speech choke are mounted in the upper rack of the first transmitter unit. Two microphones are used: a Universal BB and a KK of the same make.

On the shelf under the table is a 1500-volt power supply which handles the 203-A, 545's and 865. The plate transformer for the linear amplifier and its primary reactor are also placed on this shelf.

In addition to the receiver described above, W9DCX also has a Hammarlund Comet Pro and a National SW-3, although these are not shown in the photograph.

During the past few months reports on the 'phone have been received from 42 states, and it has also been heard in Germany and New Zealand.

W5FB, Hazen, Ark.

W5FB is a good example of a neat and effective low-power station. It is owned by Harold Clarke, Hazen, Ark., and is installed in its own 10 by 12-foot shack in the yard.

The transmitter is a push-pull TNT using a pair of 210's, and works on all three bands. It is



mounted on top of the rack which holds the power supply, and is at the left on the operating table in the photograph. The power supply is the usual 550-volt transformer, pair of '81's, and brute-force filter. The key-thump filter is built into the power supply unit. Just in front of the regular transmitter is an R.E.L. 271 outfit which is used as a spare and in emergencies.

To the right of the transmitter is an R.E.L. 231 receiver, with a home-built receiver beside it. At the extreme right is the monitor.

W5FB's antenna is a 132-foot Zepp with 45-foot feeders. The station has been on the air only since February, 1932, during which time all districts have been worked on 3500 kc. The station has also been heard in New Zealand on this band. Best DX so far is Japan, on 14 me.

K7ANQ

WAY up in Alaska," near the Alaskan Peninsula on the south side lies a group of islands called "The Shumagins," and of this group is Wossnessenski Island, the home of Miss Lily Osterback and K7ANQ.

Lily has the distinction of being Alaska's only YL, or at least we believe so; and with her kind permission we are giving the "low-down" on her station, which is known to most of the fellows on this continent, but which few have seen.

The transmitter is a self-excited outfit using a pair of 50-watters in a tuned grid tuned plate circuit. Plate voltage is obtained from a 1500-volt 900-cycle motor generator, driven by a 32-volt bank of storage batteries. Quite recently a chemical rectifier was tried and the results were beautiful. The note is high pitched (about 1800 cycles) and is often mistaken for crystal control.

The transmitter is built on a hardwood frame and three well-seasoned wood panels. The top panel holds two antenna ammeters and an antenna feeder tuning condenser. The central panel contains the controls for the oscillatory circuit, and the controls for the power supply are at the bottom.

The receiver is the "old standby" regenerative detector and 2-step, the last stage being arranged to peak at approximately 1000 cycles. There is also an auxiliary receiver which is used exclusively for long-wave press. This may be seen at the extreme right of the photo, and uses the old familiar honeycombs. Although not shown in the picture, there is a 6-tube broadcast receiver which furnishes entertainment during the long winter months.

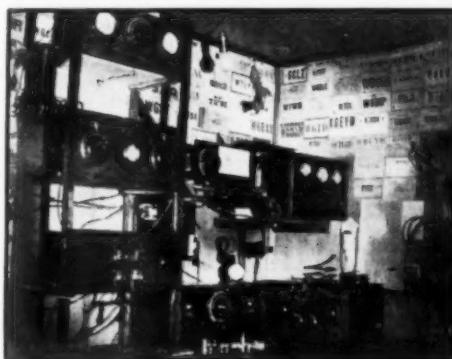
The antenna is a fundamental 7 mc. Zepp, using the second harmonic for 14 mc., although the latter band is very erratic in these latitudes.

In order to charge the numerous storage batteries used at 7ANQ a gas engine is employed since no other source of power is available.

Although DX is not slighted, Lily's main inter-

est is traffic and keeping schedules — the one with W7TX going steadily for the past three years. Traffic can be handled with the best of them, so never be afraid of sending too fast for Lily, because it just isn't done.

Four continents have been worked, and owing to the station's geographical position, regular communication is had with the Orient.



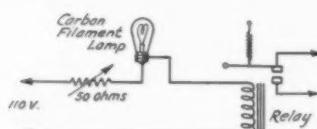
K7ANQ—WELL-KNOWN ALASKAN YL STATION

For a good rag-chew give K7ANQ a call, fellows, and see for yourself.

— Lyle Geary, VE5AW

Simple Time-Lag Device

THE accompanying diagram shows a time-lag arrangement used by N. Holman, of Singapore, which is simplicity itself. The delay action is contributed by the carbon-filament lamp in series with the relay, and the time can be varied by adjusting the tension of the relay armature spring and by the setting of the 50-ohm variable resistor. The delay is obtained by virtue of the



fact that carbon has a negative temperature coefficient of resistance, so that the relay current is small when the circuit is closed and increases to a value which will operate the armature when the lamp filament gets hot.

Naturally the size lamp required will depend on the current needed to operate the relay. Holman's juice is 110 volts d.c., which of course means that a d.c. relay will work OK. An a.c. relay can be used with a.c. supply. The device is sensitive to external temperature, which makes it necessary to re-adjust the variable resistor occasionally.



CALLS HEARD



W6DZZ, E. J. Hoetzel, 941 Stanyan St., San Francisco, Calif.

ac3ma ac6na ac6zz ac8go ac8hr ac8js ac8ns av8zk ac8st
ac1nhn auikab auilm auilnz autf5 celai ce3bm em2fm
em2gr em2gu cm2sv em2wd em2b em8by cm2j3m f3oeb
f8sx 18px ghp8 g8wy heifg hh7e j1dh j1dm j1dn j1do j1dp
j1dr j1dv j1et j1ec j1ee j1ei j1el j1em j1eo j1ep j1eq
j1er j1es j1et j1fb j1fe j1ff j1fo j1km j1sw j2eb j2ce j2ed
j2ew j2ef j2eg j3eg j3ek j3el j3er j3es j3ex j3da j3db j3dc
j3de j3df j3d3 j3d3 j3dk j3dl j3dm j3du j3do j3dp j3dt j3du
j3di j3el j3es j4cc j5cc j5ce j5eg j6cc j6ed j6ee j6eg j6f
k4rj k6na k5ab k5ae k5an k6aiu k6aja k6alm k6arb
k6auq k6av1 k6ayd k6ab1 k6b8 k6b1l k6b8y k6b8e k6ab8
k6c8o k6e6mo k6eb8 k6e8p k6ewr k6fd8 k6f8t k6fdt k6fdv
k6fdvz k6ebr k6edh k6ef7 k6fab k6fex k7ahi k7akv k7atd
k7atf k7bj k7ej k7ekk k7hv k7pq k7tf k7th kalee kaleo
kalhr kajlm kajlr kallg kalma kalrt kals1 kals9 kaiwr
kalrx kalza kalze ka3aa ka4hw ka8aa lu2en lu3dh lu3fa
lu8djde nylaab os4s os4z omfio om1th om2c om2dm
om2ma om2tg on4r pk1lex pk1ler pk1jr pk1se(a?) pk3bm
pk3bq pk3pr pk4da py1ff py2aj py2bn py2xp vk2ah vk2ax
vk2b1 vk2bh vk2bg vk2bq vk2bu vk2de vk2dr vk2dw vk2ek
vk2gr vk2he vk2hg vk2hn vk2hs vk2je vk2jt vk2lk
vk2lw vk2ls vk2oo vk2pm vk2pn vk2pr vk2px vk2ps
vk2rn vk2sp vk2tx vk2vs vk2wd vk2xf vk2yr vk3bx vk3c
vk3ep vk3dt vk3es vk3fm vk3gi vk3gv vk3je vk3jf
vk3jk vk3jt vk3ju vk3ka vk3lp vk3go vk3lq vk3ml
vk3nm vk3ou vk3qx vk3qr vk3tr vk3rs vk3tm vk3vh
vk3vl vk3bp vk3wa vk3wl vk3zw vk3zb vk3zl vk3zp
vk3zw vk3zx vk3zz vk4ah vk4as vk4fb vk4fm vk4gk
vk4hr vk4ju vk4pk vk4rj vk4rv vk4wv vk4xn vk5bm
vk5dt vk5fm vk5gl vk5gr vk5gw vk5hg vk5mb
vk5ml vk5mx vk5my vk5pkp vk5rh vk5yk vk5yk vk6bo
vk6ex vk6dh vk6fg vk6mu vk6nj vk6rl vk6rx vk6wi vk7ch
vk7ge vk7jk vk7vn vs1ab vs2ab vs3ac vs6se vs6dg
vs6ah vs6an vs6ao x1aa x1u x29a x29b x3a x4j x5l x9a
x9b x10a zeljb z1lar z1lfz z1lfu z1igo z1lgq z12ab z12ac
z12ai z12vi z12bx z12ci z12ej z12dg z12gr z13ab z13ad
z13bj z13bn z13cc z13cs z14ai z14ao z14ap z12a z14a z15c
z15l z15q z15u z15t z15r z16x z1ub nedf oxye vxz4x wteb
xxly

W6ENV, Andrew H. Elsner & W6FKC, Seth O. Perkins, Oceanside, California

7000-kg. band

vk2ba vk2dr vk2fk vk2fx vk2hw vk2ju vk2kw vk2lb vk2ml
vk2nr vk2ns vk2oj vk2px vk2pz vk2ve vk2xg vk2yj vk3al
vk3ex vk3fb vk3gg vk3ml vk3ot vk3tm vk3yp vk4ju
vk4ry vk4wt vk5fm vk5pk zl1ar zl2bz zl2ew zl2lb zl2rm
z3ee kahr kally om1eb om1ei pk3bb j1do j1ee xul
ac2ma ac8na zt6k

14-me. band

gi5qx on4fe f8yu eari85 em2fa em2fm em2mg em8az
em8yb celai ex1jw vp2dd lu3fa nylab rx1aa ti2re ti2tao
k5aa k5ae k6fzo vk2bs vk2lz vk4as zllar

*NZ15W, W. A. W. Stevens, 75 Wilson St., Hawera,
N. Z.*

3500-kg. band

g2qb k6aja k6buz k7kn k7lh k7asm vplfr ve2mo ve3oc
ve3gt ve4bb ve5ag ve5al ve5ef wlagn wlbfsl wlbu wlbjc

w1ebx w1cht w1crw w1id w1mk w1zza w2ahp w2ag
w2bex w2go w3ain w3bvn w3bjl w3bwt w3rw w3t
w4ana w4aad w5acb w4adn w4fi w4kp w4nlw4lu w5ec w4uc
w5acb w5awc w5apg w5boo w5bri w5bmi w5bmo w5i
w5uq w5yh w5ak w5aze w5iae w5iacz w5abf w5baf w5bce
w5aep w5ane w5bxe w6bms w6bjg w6bf5 w6bos w6bfe
w6bos w6bu w6elp w6cxg w6cxw w6emr w6cjq w6ctr
w6end w6dgi w6djj w6day w6dyk w6dk5 w6ee w6et
w6evr w6exg w6esx w6fca w6eb w6etm w6efb w6el
w6evd w6ebg w6eqj w6fy w6ehm w6elw w6fu w6fb
w6ms w6nf w6rj w6yau w7alf w7adk w7adf w7alm w7awl
w7aen w7aqx w7aib w7am w7avt w7awh w7bcu w7bda
w7bke w7bov w7exg w7du w7oj w7qp w7uj w8askv w8bin
w8bjg w8daq w8dms w8emt w8exm w8ent w8hd w8mt
w9ara w9ac1 w9bnt w9btt w9bfw w9bbl w9ene w9ere
w9ela w9drd w9deo w9ees w9edw w9eal w9ebd w9eed
w9avf w9flg w9fbc w9gbq w9gyk w9hbw w9hay
w9hyo w9huy w9lew w9ika w9iqz x4m x1tp zt6k

7000-ke. band

ac8go ac8sr ar8gyn aulka aulen aulen ce3de cm2ws
d4aaav ear177 ear224 eilk ex7e fsfw s18a fmr8c
f3ock fm8jo g2lz g2zd ha3df ha9af hb9b hb9q j1ee j3dh
j3dk kalhr k4es k6aja k6auq k6bmy k6dijg k6dvs k6ir
kgtg la1j nylns oa4u oa4al obgr2 om1fo om2tg oa2t2u
pa0fp pa0pq pa0gh pk3bm pk3pr sm6us ap3om zt2u
un7vv ve2be ve3bm vplfr vp1ff vslad vs3ac vs6ag vs7ap
vu2fx vu2lj wlae wlavv wlbxce wleek wl2z wl3w
w2anx w2ag w2bs w2bkw w2bj w2bds w2bvc w2bnv w2ec
w2cej w2dn w2dn w2fk w2nt w3brv w3brf w3bru w3eng
w3nt w3nt w3ut w3auu w3bso w4gh w4ls w4us w4pp
w5atf w5afv w5aqy w5bpn w5fe w5fw w5ow w5tr w5r
w5rv w6ahp w6alx w6aor w6axm w6ahz w6bgv w6bd
w6cl w6ctx w6eyr w6ckq w6dmn w6efn w6eqc w6gm
w6hs w6ig w6ks w6uss w7ait w7awz w7abz w7ath w7ast
w7bb w7qh w7ts w8cif w8fjn w8ij w8zb w9bh w9bm
w9dyf w9eqg w9ef w9eky w9gbj x1d x1m xulaa zslp
z2s2 z5u1 z5t5 z6tk

*W1BO, Malcolm Bruce, 9 North St., Plymouth,
Mass.*

14,000-ke. band

ce3ag em2jt cm2mg cm2vm cm2wd ct1bg ct1bx ct3ad
d4abg d4ey d4jpc d4nlx d4oyz d4poj ear10 ear185
ear224 ei2h eif8t f18ox f8tp f8vy g2ak g2bm g2dh g2u
g2on g2oe g2oi g5bd g5ev g5hb g5ju g5ku g5nf g5np g6o
g5pi g5pl g5uy g5ah g5tz g5vn g6bu g6hd g6hp g6kp g6y
g6vp g6wk g6wy g6xb g6yx haflg hafl2 hb9g he1f9g
jia5s k5ad k5ae k7tf la2c lu2cs lu3oa lu6hk ny1ab oau
ok2lo ok2ma ok2rn on4fe on4fm on4gn oz5x oaz7kb o8s
pa0ld pa0xf pa0zk py2bq rx1aa smw1 spl198 (raq?) ti2re
uo1lh vo8an vy2ja x3a xba vy3lo

*W2ZZDL, Frank Anzalone, 138 Pine St., Cliffside,
N. J.*

14,000-kg. band

cm2fa cm2fm cm2jm cm2mg cm6gcs d4aar d4poj ear12l
ear169 earvb f8ej g2bm g5cx g5hb g5og gi5qx g5vb haf1g
hf2zd hc2ea hj1wa hklz k5ua k5ad ok2va pa0uv rxlaa
ti2tao veled ve3hw ve4bb ve4bj ve4he w6aaaz w6zzbm
w7ca1 w7vh

14,000-ke. band 'phones

em2fa em2la ti3la veldq ve3gs

I. A. R. U. NEWS

Devoted to the interests and activities of the

INTERNATIONAL AMATEUR RADIO UNION

President: H. P. MAXIM

Vice-President: C. H. STEWART

Secretary: K. B. WARNER

Headquarters Society:

THE AMERICAN RADIO RELAY LEAGUE, West Hartford, Conn.

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national Radioamateurisme
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Transmitters
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Radio Society of Great Britain
Rete dos Emissores Portugueses
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South African Radio Relay League
Suomen Radioamatööriliitto r.y.
Sveriges Sandareamatörer
Union Schweiz Kurzwellen Amateure
Wireless Institute of Australia
Wireless Society of Ireland

Conducted by Clinton B. DeSoto

A LONG-AWAITED opportunity has come to amateur radio in the British Isles. On July 28th came first official announcement of the formation of a Royal Naval Wireless Auxiliary Reserve, with an organization somewhat similar to the U. S. Naval Reserve and the Army-Amateur Radio System. The Reserve will be drawn from those who are interested in the art of radio communication, and naturally it is expected that the vast majority of those enlisting will be members of the R.S.G.B.

The organization plans have been proceeding ever since the first of the year, having been arranged by an Admiralty Committee of which three R.S.G.B. officers were members. The organization plans were based largely upon information supplied by the A.R.R.L. in connection with the U. S. Reserves. The Reserve will be divided into Areas, Districts, Sections and Units. The Units will consist of 10 members of the Reserve, five of whom shall possess some transmitting facilities.

The response to date has been even more enthusiastic than was anticipated, and there is every indication that the Reserve will be in full operation within the London districts before the end of October.

At the R.S.G.B.'s Seventh Convention Capt. Murray, Director of Signals Department, Admiralty, addressed the members and gave a clear explanation of its objects, which, briefly, are intended to provide a reserve of trained operators for naval service in time of war. It is hoped eventually to extend the scope of the Reserve into other parts of the British Empire.

We have been requested to publish the following notice to American and other amateurs regarding

traffic conditions in Australia and New Zealand: "It is a breach of the regulations for VK and ZL hams to accept messages of a personal character from overseas stations. Only recently the acceptance of such messages has come under the notice of the Radio Inspectors of Australia and New Zealand, and the amateurs concerned have rendered themselves liable to being dealt with by their respective authorities. Please don't call VK and ZL if you have messages of a personal character for delivery or relay."

A protest against our practice of listing the Island of Formosa's unofficial prefix as "YK" comes from Osamu Tsukiji, a Japanese amateur. By his statement, the correct prefix for Formosa (or Taiwan, which Japanese assert is the correct name for the island) is not YK, but is J9, being in the Taihoku or 9th Japanese district. Taiwan is a dominion of Japan, says Tsukiji, and when an amateur living there desires to build an amateur station, he must secure permission from Teishinsho, the Department of Communications. Use of the prefix YK is illegal, and denotes an undercover or "bootleg" station.

The map of Japan's inspection districts reproduced elsewhere in these columns will give a clearer idea of the situation.

The maximum power input permitted in the French QRP tests held during the week of September 11th-18th was five watts, the use of either 'phone or C.W. being permitted. The tests were organized by M. Bouchard, F8ZB, and while we have as yet no information as to their outcome, the probability is that some highly interesting long distance work was done by the low-powered French stations.

The R.E.F. requests that reports be sent on the reception of all French stations during this period, if this has not already been done. Just take a glance through your log for that week, and



send QSL cards as you find the entries. Make doubly certain that this has been done in the event you have worked any F stations.

The Seventh R.S.G.B. Convention proved even more successful than its competitors. The proceedings opened on Friday, August 26th, reports J. Clarricoats, R.S.G.B.'s Hon. Secretary, and the first event was a lecture delivered by Mr. C. F. Booth of the G. P. O. Radio Section on the subject, "Measurement of Frequency."

On the following day a delegates' meeting was held in which all English districts were represented. Many important decisions were reached, including the arrangements for future Society tests. The business meeting followed, during which the Society awards for the year were presented.

The convention concluded with a dinner at which nearly 150 members were present.

An interesting bit of ultra high frequency work is reported by Pierre Godfrin, F8BJ, in which the reception of 7.6 meter signals was accomplished across practically the whole of France. F8GQ, located in Granville (Manche) was able to identify and obtain verification of the radio-telephone transmissions of a station at Corse de Calenzana, working duplex with Nice. The receiver consisted of a regenerative detector with two stages of a.f. The power used at the Calenzana station was in the neighborhood of 200 watts, feeding into a directional antenna. Re-

ports on reception of this station in other parts of Europe would be welcomed by the R.E.F.

H. A. Maxwell-Whyte, "Ham" member of the WAC Club, reports an excellent contact with ZLAAO on 7 mc. 'phone. Both voice and a phonograph record went through QSA5 for nearly an hour. G6WY suggests that this may be a possible world's record for consistent telephony, the distance being about 13,000 miles. The input used was 170 watts to the last stage. The previous day 'phone was put through to ZL3AQ, who received the music on the loudspeaker. G6WY promises to claim a 'phone WAC in the near future.

Which leads us to comment that the 'phone WAC business has been decidedly lagging of late. There hasn't been one issued since October 11, 1930, and the original four 'phone WACmen, ON4UU, VK2HC, G5BY, and GI5NJ, are still the only holders of this special certificate. We've had threats of applications from several international 'phonists, but none have as yet materialized. Has the depression hit intercontinental voice for some reason?

8000 miles per watt is the latest achievement standing to the credit of Jim Watson, VK3NQ, QRP addict. As reported by Eric W. Trebilcock, the "Overtone King," VK3NQ QSO'd F8EJ when using a type '01A tube with a plate potential of some 100 volts. VK3NQ made WAC, using under ten watts, you know.

A great deal of FB 28 mc. work is being done throughout Europe at the present time, distances up to 3500 miles being reported. Unfortunately, only commercial harmonics have been heard from the U. S. It seems that the best distances for working over there are up to 800-1000 miles, according to G5FV.

Stung by such instances as this, renewed activity on 28 mc. is being broached by a few W's, notably W9GFZ and W1SZ.

Amateur Radio in New Zealand

By D. Wilkinson, President N.Z.A.R.T.

THE year 1921, when a number of experimenters were granted provisional licenses for reception, marks the official beginning of amateur radio activity in New Zealand.

In 1922, Mr. Ralph Slade of Timaru startled the amateur world by consistently logging the signals from American amateur stations on 200 meters.

In 1923 the provisional amateur licenses were replaced by regular ones, and the first amateur transmitting stations came into operation. Communication with all parts of New Zealand and later Australia soon became commonplace on

wavelengths around 160 meters, Mr. Frank Bell, 4AA, leading the way.

In 1924 the first success in the realm of long distance work was achieved by Mr. Ivan O'Meara, 2AC, who succeeded in working with the Argentine station CB8 in the neighborhood of 110 meters. A few weeks later the first contact with America took place when 4AA worked the Californian station 6BCP. On Sept. 17th, 1924, Mr. Slade's signals from 4AG were heard in England on 90 meters, and the following day Mr. Bell, 4AA, worked 2SZ, London. Soon afterwards Mr.



VK3RJ, THE WELL-KNOWN CALL OF RAY E. JONES, BOX HILL, MELBOURNE, VICTORIA, ISSUES FROM THE EQUIPMENT ABOVE

40 watts input to the MOPA, "à la Hull, March, 1931," has resulted in the respectable total of 60 countries worked and upwards of 800 W QSO's with all states. On several occasions the station has been placed at the service of the Postmaster General when submarine cables failed.

Shiel, 4AK, of Dunedin, worked a station in France situated only a few miles from his antipodes. These great achievements were sufficient to identify New Zealand amateurs as among the most successful in the world, and to mark 1924 as the outstanding year in all the history of international radio communication.

In 1925 New Zealand amateurs were granted the use of wavelengths around 32 meters in the higher frequency regions, and on these waves excellent long distance work was consistently performed and communication with every part of the globe took place. However, it was not until 1927 that contact with South Africa was accomplished, the honor going to Miss Brenda Bell, of 4AA.

In 1926, due chiefly to the efforts of amateurs in the Auckland district, an association was constituted to be known as the New Zealand Association of Radio Transmitters, representing the amateur fraternity throughout New Zealand. The Association was soon firmly established and a monthly bulletin of its activities was published — "Break-In."

The one outstanding accomplishment of 1928 was the first successful two-way work with an overseas station on a wavelength near ten meters, when Mr. Arthur, 1AN, communicated with an Australian amateur.

During the past three years the association has made wonderful progress, and the membership now stands at seven hundred, consisting of 400 transmitting members and 300 receiving members. The annual subscription is five shillings (approximately one dollar) and the monthly bulletin "Break-In," which is distributed gratis to all members, has grown into a 32-page publication and ranks as the best amateur effort in the Southern Hemisphere.

An annual convention is held each year between Christmas and the New Year. Headquarters is situated in Christchurch, postal address Box 617, and the QSL Bureau in Ashburton, Box 25.

Officers of the Association are as follows:

President	D. Wilkinson, ZL2AB
Vice-Pres.	H. B. Arthur, ZL1AN
	I. O'Meara, ZL2AC
	N. W. Laugesen, ZL3AS
	N. Shrimpton, ZL4AO
Gen. Secretary	R. T. Stanton, ZL3AZ
Ass't Sec'y	R. K. Venables, ZL3BZ
Treasurer	N. W. Laugesen, ZL3AS
Editors	H. P. V. Brown, ZL3CG
	N. W. Laugesen, ZL3AS
Distribution	
Manager	C. W. Parton, ZL3CP
QSL Bureau	G. Clarkson, ZL3CD

Silent Keys

It is with deep regret that we record the passing of these amateurs:

- Thomas W. Baird, W7VIL, Spokane, Wash.
Warren C. Elmore, W7BRB, Great Falls, Mont.
Glen K. Groom, W6BPN, Los Angeles, Calif.
William Carter Hamilton, W9GCF, Sedalia, Mo.
Marshall Hendricks, W3MM, Allentown, Pa.
Frederick A. Hill, ex-4GL, ex-9BHX, Savannah, Ga.
Claude E. Judd, W7BKR, Bremerton, Wash.
Philip E. Lowell, Portland, Me.
Donnell O'Conner, ex-SVR, Rochester, N. Y.
Henry F. Pribbenow, W9BUN, Wichita, Kans.
Z. Smith Reynolds, W4ZZH, Winston-Salem, N. C.
G. W. Salt, VS2AF, Selangor, Malaya.
I. A. Sowder, W4OR, Chattanooga, Tenn.
J. R. Walker, W9BXJ, Mason City, Ill.

THE COMMUNICATIONS DEPARTMENT



F. E. Handy, Communications Manager
E. L. Battey, Assistant Communications Manager



Ham Splutterings: Alaska

THE terrible jolt from eleven 'mikes of 500-volt condensers, supposedly "dead," VE3TW's formula (June *QST*) "Each foot jumped backwards = 100 volts" should be ".50 volts," or perhaps it's the altitude here.

Hamdom's Purgatory — a one-building camp, with three BCL's on the one power line with the transmitter.

The two A-1 YLs op at K7ANQ. To the OM's "GE Lily" the answer is invariably, "GE, OM, this is Eleanor," or vice versa. The very YL at K7BND (twelve years to you, Curious!) with the nice keying and the sweet nothings — Ah, there, Virginia!

Do BCL's go to heaven? Such language! K7ATD's comments on all the broken-hearted YL's he left in "Sunny Cal." and the wailings for his station cat, which was, but is no more. Ambitions: (1) To put out a sig with a note like K7FF's. (2) To follow in the footsteps of W7BB in his wanderings and visits to foreign hams (July *QST*). Are BCL's necessary in making up a complete world?

Bedlam — any Saturday night on 7 mc. Time for prayer — when a W6 with an R7-a-c. note smothers your first ZL. The ships in the forty meter band with the odd calls (try to find them in any call-book) and such secrecy. "No, can't tell you where I'm from, where we're going or what boat this is, but we're on the Pacific." Oh, thanks much! Didn't know but what you were in the English Channel! Lessons in real operating — listening to W6USA. Did you ever hear KAIHR when they weren't handling traffic? W7BB's snappy procedure on traffic skeds. Easy to imagine DA's mutterings sotto voce when he is trying to shove traffic through to a "6" on a bum night from up at K7UT. Why is a BCL anyway? The rum-dum BCL in the room below who tunes his 12-tube super-regenerative short-wave set to your receiver in the middle of an important QSO, and wonders why he can't get the music to come through! Pounding the floor with a heavy-duty "B" and telling him to get off so you can hear something. In jazz selections we have "The One-Man Band," and among hams, "The One-Band Man."

— Al Domenico, K7BLI, Jumbo Mine, Kennecott, Alaska

To Improve Relaying—Do More

Listening

By F. C. Everett*

WHEN a commercial operator has traffic for a given direction a short call will always give him the correct station, for he knows what station is in the right direction. That station will be listening for him. Amateur operation is not that easy because of the scattered frequencies of amateurs and the peculiar paths upon which their itch to transmit leads them.

* W8CMY (ex-SBNW, 8AEZ, KENQ, WTCS, KDRR).
411 Palmwood Ave., Delta, Ohio.

Amateur operators will exert a great amount of care and energy in arranging and organizing schedules, opening wonderfully reliable traffic routes. Yet it is sometimes virtually impossible for any station not scheduled to get a message into a "scheduled" route without a pure accident. Too often these same stations will, in general, confine their operation to their own little clique.

A station operating, say on the 3500-ke. band and handling large quantities of traffic, or at least on the air pretty consistently gets to be quite well known. If another station has traffic for the point this station is located, or for a city in the direction of this station, the operator is quite apt to wish that he could pass along his messages; provided he can raise you, who operate in such a reliable net. His only opportunity to do so is to answer one of your CQs or else raise you after you finish working some one on schedule or otherwise.

The regulations and A.R.R.L. procedure are arranged to automatically take care of this possibility. After you send SK and your call you are expected to immediately turn your dial and listen for other stations that may be calling you. Unfortunately, comparatively few stations follow this simple idea. Properly speaking, SK means the end of a communication, and when used in this sense it may mean that you will immediately break out into new CQ flames. You may turn in for the night (you should send CL if you so intend, though), or you may walk to the window for a moment to light a cigarette.

Several stations have formed the habit of using QRZ? after SK and their call to indicate that they *really will* cover the band before proceeding further. Others call CQ just once to make known their intentions. Thus — SK W8CMY QRZ? or SK W8CMY CQ de W8CMY. Personally I prefer the former method.

I heard another very fine use of the single CQ the other night. The operator in question was calling a station and had, of course, repeated that station's call and his own several times. He obviously didn't raise him for in just a moment he said CQ de W9XXX — just the once, but I called and raised him. The advantage is obvious.

Those little sure-footed movements on your part will brand you as a good operator among the fraternity and make them anxious to hand you traffic and it is surprising how you can make messages appear apparently out of thin air if you use good procedure.

Listen around the band a bit and find out who works schedules with whom. It will help you to route traffic more intelligently and expedite and help guarantee its delivery. It doesn't take much listening to find out which stations handle traffic consistently and do good operating. Then you will be able to help cut down general QRM by having to use your ether disturbed less and save yourself a lot of time in the long run.

Let's have more Gozinta and less Gozouta.

Traffic Briefs

The July issue of *Shell Progress* (sent us by courtesy of W6CAW) contains an interesting description of the work of

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W6CNO, the amateur station of Mr. John Stenson, Santa Barbara, Calif.

W6CNO not only originates a good number of messages from travelers, but schedules are maintained with many points up and down the Pacific Coast to distribute them. "Between times" Mr. Stenson's brass pounding helps to deliver messages and roll up a nice total — and he is often able to find out information regarding touring conditions — or surprise the next automobilist to stop at his filling station by giving him positive information that it may be "raining pitchforks" 30 or 40 miles down the road.

Walter A. Cobb, newly elected SCM of Northern New Jersey, is also a charter member of "W.A.C." (His name alone would entitle him to that distinction.) Lots of pep in his community says Walt in a recent letter. His address is "28-Ampere Parkway, East Orange, N. J., and he originally hailed from Ampere, N. J., so why not?

W7BB sends an interesting bit of news as follows: "We work Ed Mahoney of OM1TB, Sunay, Guam, nearly every day. The average report at both ends is R8-9. One day when we were putting a very husky signal into OM1TB he fed our signals into a home-made class B amplifier. He then proceeded to break the plate circuit and key the OM1TB transmitter with our transmission. Every dot carried perfectly. In other words, there was a perfect remote control job just about four thousand miles away. This is almost a record for ham 'remote control,' isn't it?"

The following contribution by Mr. Jack Wagener, W3GS, wins the C.D. article contest prize for this month.

Your articles on any phase of amateur communication activity are solicited. Each month the prize winner has his choice of three selections of prizes. See page 55, September, 1932, QST, for more complete details of the article contest. Send yours today. — F. E. H.

Why Handle Traffic?

By Jack Wagener, W3GS*

A GREAT number of the amateurs to-day when approached on the subject, say: "Why Handle Traffic?" Well, OM, there must be a reason because for several years traffic handling has increased remarkably. Every day more amateurs are realizing that this is the most important and most interesting branch of amateur radio. Traffic handling is the backbone of amateur radio, OM, and every one must do his share to strengthen that backbone.

More fun may be derived from handling traffic than from any other amateur activity. If any amateur does not get this great pleasure, it is because he does not handle traffic in the right way. It is necessary to make schedules. Don't make a schedule with the first station which you hear, but pick out a good reliable station with an operator who also likes to handle traffic. Pick out an operator who can copy all your messages with ease. Then you will begin to get fun out of traffic handling, OM. It surely is a pleasure to send messages just as fast as you want and always have the other fellow come back and say: "All O.K." Then again when relaying to a good reliable station, you have the pleasure of knowing that your messages will be delivered or passed on to some other reliable station.

Now look at the other side of the story. Most amateurs do not realize how much pleasure people get out of receiving radiograms. Every time you deliver a message you make someone very happy, OM. You will find that the person to whom you deliver the message will appreciate it so much that he will never stop thanking you. The writer has hundreds of letters of thanks for delivering radiograms, including some from lieutenants, colonels, captains, notable business men, movie stars, and even governors. Try it,

OM! Strengthen the backbone of amateur radio by participating in the most enjoyable branch of amateur radio.

HOW TO BECOME AN ORS

The nature of some of the questions the writer is asked makes it evident that many new traffic men do not know just how to go about becoming an ORS. We need more ORS, and we want everyone interested to know just how such appointments are made so that the proper steps will be taken.

A deep interest in traffic handling is the most essential factor in becoming an ORS. Make traffic your most important station activity. Make at least one schedule in each direction and handle as much traffic as possible. Keep a copy of every message handled, and on the 16th of each month report your traffic total to your Section Communications Manager. (It is welcome whether you hold ORS or not.) Include in this report any special activities, experiments, or accomplishments which have taken place at your station.

After reporting to your SCM for three consecutive months, make application to him for ORS appointment. Your SCM will then send you the regular ORS forms to be completed and returned to him as soon as possible. If these are in order, the SCM will send you a form sheet by means of which a "test" schedule will be arranged between the applicant and the SCM (or some station appointed by him). The purpose of this "sized" is to give the applicant a test on actual traffic handling over the air, in use of proper procedure, and to verify that the applicant can copy fifteen words per minute.

If the above requirements are fulfilled and you qualify as an ultra-reliable the SCM will forward your ORS certificate of appointment. Once an ORS you will receive report cards, the ORS bulletin, and other valuable advance information from Headquarters. You may also then participate in the big quarterly ORS parties. Become an ORS, OM. All the best stations are ORS — ORS are the best stations.

* A.R.R.L. Section Communications Manager Eastern Pennsylvania, 210 Main St., Pennsburg, Pa.

Three S.C.M.s Honored

Herman Radloff, W9AIR, received the commendation and best wishes of "the gang" when he was presented with a ten-dollar gold piece at the Southern Minnesota Ham Convention banquet at Mankato, Minn., September 10th. "A new amateur experience in Rad's eight years of pleasant associations in our amateur radio fraternity," he says.



O. J. Spetter, W9FLG, and the Kansas Wouff-Hong Trophy, presented at the Kansas Midwest Division Convention in recognition of his leadership and the quality of his station and operating. This initial presentation of the Kaw Valley Radio Club is a replica of the original wouff-hong at Headquarters. It is made entirely of wood from a spar of the frigate *Constitution*, the "Old Ironsides" of naval song.

and story. This trophy will become the permanent possession of the Kansas amateur winning it three years in succession. Spetter, active in amateur radio for twenty years, received an overwhelming vote for the first award of this new honor to "the Kansas amateur who has done most for amateur radio in the past year."

I. S. Liner, KA1SL, A.R.R.L. Section Communications Manager for the Philippines, is now in this country visiting at Beverly Hills, Calif. The Thursday preceding his departure the KA-gang presented him with a silver cup inscribed suitably in appreciation of his services as S.C.M. Liner expects to return to his position in Manila in about four months. In the meantime Thompson, KA1XA, is appointed Acting S.C.M. for P. I.

Traffic Briefs

C. D. Slaten, K6COG, SCM Hawaii, was married on August 27. Best wishes and much happiness, OM.

Operator Magner of RX1AA spent a two weeks' vacation at W2ADQ, where he maintained contact with his wife via a schedule, W2ADQ-RX1AA. The YF is an op also. Magner kept the W2ADQ-NY1AB schedules while W2ADQ was on vacation.

Another about fast relaying: Here's how it's done at W7BB. On August 25th W1MK gave W7BB three messages for the Philippine Islands, one for Hawaii, and one for Alaska. W7BB passed the P. I. traffic to K4LY within five hours, the Hawaiian traffic to K6EBR in about three hours and the Alaskan message to W7TX-K7PQ within thirty minutes. Traffic doesn't linger long at W7BB's shack!

Use Standard Message Form

IN THE course of eight evenings communications I found seventeen different operators all using a different message form. Some sent no date. Some sent the number of the message last and no town or station of origin. Some sent incomplete addresses. Oh, me! The results were unlike radiograms in the poor form these operators used. Why not adopt the standard A.R.R.L. message form for amateur work?

The advantages of standard forms are numerous; in fact, could be listed for hours at a time. In the first place, better form speeds up traffic handling, requires less fills or RQs, prevents garbled messages, makes for more reliable traffic schedules and has many other advantages. Traffic handling is an important to hams as putting power into their antennas! More attention to proper message form should better traffic handling as a whole.

Proper form makes a neat appearing message when written out, easy to file, and easy to trace every movement. It makes traffic increasingly worthwhile, and much more a pleasure to handle in business-like fashion. San Francisco can boast of good traffic procedure, though it doesn't have as many reporting stations as some of the other sections. Use of standard procedure and proper systems is certainly A-1 here. A message in the regular A.R.R.L. form recommended for amateur work is as follows:

SAN FRANCISCO CALIF W6ZF NR 101.
NOV 18 CK 47

ALL RADIO AMATEURS

CARE ARRL WESTHARTFORD CONN

HOW DO YOU LIKE IT DOES IT NOT APPEAL TO YOUR GOOD SENSE OF JUDGMENT HAM RADIO NEEDS A STANDARD FORM OF MESSAGES WILL YOU DO YOUR BIT TOWARD THE MOVEMENT

W6ZF W6AYC

— R. G. Martin, W6ZF-W6AYC,
Manager KUP, San Francisco

Relative Traffic Standings

(AUGUST-SEPTEMBER)

Messages Per Station (25%)	Stations Reporting Traffic (25%)	Gain or Loss (Traffic Reports) (25%)	Traffic Total (25%)	Standing Based on Average of All Four Ratings %	Leading Section in Division	
Mid.	93.	Cen.	294	Pac.	17821	Pacific 87.5* Los Angeles
Atl.	70	Pac.	282	Mid.	11068	Midwest 85.7 Kansas
W. G.	66	N. E.	146	Cen.	9812	Central 78.6 Illinois
Pac.	63	Atl.	136	Pac.	9528	Atlantic 71.5 Western New York
Can.	61	N. W.	126	Hud.	7241	New England 57.5 Connecticut
N. W.	52	Mid.	119	Dak.	4162	Dakota 55.4 Southern Minnesota
Dak.	52	Roa.	84	N. E.	4150	Northwestern 53.7 Oregon
Roa.	49	Dak.	72	Roa.	3780	Roanoke 53.7 West Virginia
R. Mt.	49	S. E.	65	R. Mt.	3441	West Gulf 44.7 Southern Texas
Hud.	46	Hud.	62	Ath.	3273	Hudson 42.9 New York City-L. I.
Cen.	33	Can.	53	W. G.	2885	Southeastern 42.9 Eastern Florida
N. E.	30	W. G.	52	Delt. \ddagger (+12)	1827	Canada 37.5 British Columbia
S. E.	28	R. Mt.	26	Can.	1285	Rocky Mt. 28.5 Utah-Wyoming
Delt.	24	Delt.	24	N. W.	598	Delta 10.7 Arkansas

THE TEN HIGHEST SECTIONS

S. C. M.

Kans.	213	9	Los Ang.	163	E. Fla.	+21	Kans.	8558	Los Angeles	70.	Nahmens, W6HT
E. Bay	169	5	Mich.	96	Los Ang.	+18	Los Ang.	6514	Kansas	62.5	Spetter, W9FLG
P. I.	155	8	Ill.	76	San Jose.	+17	Wash.	4312	Michigan	47.5	Conroy, W8DYH
S. E.	135	6	Wash.	73	Ill.	+11	W. N. Y.	3605	Illinois	42.5	Hinds, W9WR-APY
B. C.	135	4	Ohio	57	Mich.	+10	E. Bay	3391	East Bay	37.5	Houston, W6ZM
M.-D.-D. C.	105	6	Mo.	44	Conn.	+10	Ohio	3069	Washington	37.5	Grubie, W7RT
W. Va.	103	5	Conn.	43	N. V. C.-L. I.	+10	Mich.	2922	Ohio	27.5	Tummonds, W8BAH
Alaska	100	1	W. N. Y.	42	Kans.	+9	W. Va.	2589	Western N. Y.	25.	Farrall, W8DSP
Ga.-S. C., etc.	100	1	Kans.	40	W. Pa.	+9	Ill.	2452	Eastern Fla.	25.	Atkinson, W4NN
So. Tex.	98	3	Va.	39	Ky.	+9	S. F.	2170	Connecticut	22.5	Ells, W1CTI

The Traffic Banner returns to LOS ANGELES this month after a one month's stay in Kansas. W9FLG and his team made a good attempt to retain the honors, however, and are close on L. A.'s heels. For the third consecutive month Los Angeles sets a new "all time high" in number of stations reporting traffic with 163 traffic reports! (The previous high was L. A.'s 145 of July-August.) This month we report a gain of 137 stations handling traffic over the previous month.

During the traffic reporting month August 16th-September 15th, 1541 stations originated 19,203; delivered 15,041;

relayed 46,887; total 81,131, (78.2% del.) (52.6 m.p.s.)

* No reports were received this month from the Sacramento Valley and Hawaiian Sections.

† The "Gain or Loss" standing for the Delta Division is determined by a comparison of the figures for the April-May reporting month, that being the last month when a report was received from every Section of this Division. Actual "gain or loss" figures from July-August are given parenthetically and are used in computing the "gain or loss" for the whole field organization.

BRASS POUNDERS' LEAGUE

Call	Ortg.	Del.	Rel.	Total
CX7	2268	1352	—	3620
W3CXL	243	117	836	1196
WSGB	60	158	844	1002
W6PQ	—	—	1012	1012
KA1HR	217	127	596	940
W9YAB	396	352	70	818
W3LHF-NW	53	123	612	788
W9QW	93	93	531	717
WTBB	301	188	214	703
W9NK	—	—	655	655
W9CDA	19	29	606	654
W9NAC	149	173	312	634
WSDDS	574	8	42	624
W9GNW	224	—	392	616
W9FLG	133	342	88	563
W9GMX	3	6	554	563
W9PP	62	70	407	539
W6EZK	108	82	346	536
W9HHC	14	41	412	530
W9JNV	284	29	226	530
W9AWH	20	27	478	525
W2ADQ	251	269	2	522
W9ALW	6	34	470	510
VE5DH	320	174	6	500
NY1AB	164	126	186	476
W4UT	53	115	251	419
W6AMM	130	28	—	412
W3BWT	98	113	196	407
W6ETJ	95	187	116	398
W8VP	36	103	259	398
W9KG	27	17	208	382
W6CDU	54	114	202	370
W1MK	96	128	102	326
VE5DB	152	160	8	320
W2SC	12	132	148	292
K7PQ	69	102	59	230
W6HM	67	154	—	221
W6GDU	20	150	—	170

Month of August 16th-September 15th. Note the stations responsible for above one hundred deliveries.

Deliveries count!

A total of 500 or more bona fide messages handled and counted in accordance with A.R.R.L. practice, or just 100 or more deliveries will put you in line for a place in the B.P.L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify you for B.P.L. membership also?

* Correct listing for this station for July-August.

W6GMX, W6NF-CFN, W6ON, W6TE, W6ZX
W7AAAT, W7AJI, W7ANF, W7APE, W7AVM, W7AYH,
W7BCV, W7BII, W7BZ, W7FL, W7PL.

W8AFM, W8AGS, W8AJU, W8AQF, W8AYU, W8BCZ,
W8BLP, W8BWP, W8CEO, W8CPE, W8CRA, W8DBY,
W8DED, W8DLG, W8DME, W8DPF, W8DPO, W8DRJ,
W8DYG, W8EVC, W8GPS, W8HD, W8NW, W8WF.

W9AB, W9ACU, W9AFN, W9AFQ, W9AHQ, W9APR,
W9ARK, W9BAN, W9BEF, W9BKJ, W9BRA, W9CJJ,
W9CJQ, W9CSB, W9CTB, W9CWG, W9DGE, W9DOE-
BC, W9DUD, W9DYG, W9EDW, W9EQX, W9ERU,
W9ESL, W9ETD, W9FAD, W9FCW, W9FF, W9FFD,
W9FKE, W9FNK, W9FRA, W9FYB, W9FYM, W9FZO,
W9GDU, W9GFA, W9HJC, W9IK, W9JL, W9SO,
W9TE, W9VD, W9EPY.

CMSYB.

VE3AU.

New Record for WAC

A WORLD'S record brought back to the U. S. A. On Sunday morning, September 18th, Wallie Gee, W6EGH (Inglewood, Calif.), broke the record time for making WAC by working 'em all in three hours and seven minutes: (7 mc.) VK3CP, 6.25 a.m., P.S.T.; CR7AC, 6.50 a.m.; VS6AB, 7.50 a.m.; (14 mc.) G5BJ, 8.35 a.m.; LU4ML, 9.25 a.m.; W6FAL, 9.32 a.m. Wallie remarks that it's somewhat unusual for Africa and Europe to come through well in the morning, as the sige have been doing lately.

The previous record was that held by VK3LP, who worked around the globe in four and one-half hours.

ATLANTIC DIVISION

WESTERN PENNSYLVANIA — SCM, C. H. Grossarth, W8CUG — W8DLG is high man this time. W8AJE is working on the Pittsburgh Net. W8KD was at the Cleveland Convention. A new station is W8HUJ. W8FKU is working in the W. Pa. Net. W8DXI reports new hams W8HMQ and W8HNK in Erie. W8HGG took his test for license. W8BML has a nice total. W8AJU was commissioned in the Naval Reserve. W8EDG reports W8HTC, W8HTG and W8HBP new hams in his vicinity. W8ELZ got his ORS. W8DKL wants to hook the gang on Sunday mornings. W8BKS is active at the Naval Reserve Armory. W8YA says, "Back on the air and ready go do." W8CQA tells us that W8ESR has four daily schedules. W8BWL says the Altoona Radio Club started up three new hams. W8CMP kept a schedule with W8CPY. W8AVY cancelled his OBS. W8GUB is after an ORS. W8AAQ was married Sept. 4th. W8HPQ is a new ham in Pittsburgh. W8CAX has returned to college. W8SCQ is looking for traffic. W8CFR is having transmitter trouble. W8DRO is on 7 mc. W8DYF promises more traffic. W8AZG has been working DX on 7 mc. W8FAK has a hard time getting traffic. W8BSO says the Amateur Transmitters Association of W. Pa. elects new officers in October. W8CUG has been repairing his big stick. W8GON reports from State College. W8DVZ reports for W8VI and W8GN. W8CEE is studying for his amateur exam. W8GRA is busy getting his rig working. Reports were received from W8EEC, W8FPD, W8GBC, W8BCK and W8FH.

Traffic: W8DLG 437, W8AJE 343, W8KD 262, W8CAX 118, W8FKU 91, W8CUG 86, W8DXI 81, W8HGG 68, W8BML 65, W8AJU 60, W8EDG 58, W8ELZ 57, W8DKL 49, W8BKS 32, W8YA 32, W8FH 21, W8CQA 20, W8BWL 19, W8GBC 17, W8FPD 17, W8AZG 12, W8FAK 11, W8AAQ 9, W8CMP 8, W8AVY 5, W8DRO 2, W8DYF 2, W8EEC 1, W8GUB 3, W8DVZ 12, W8GN 21, W8VI 5, W8BCK 38.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Harry Ginsberg, W3NY — W3BAK, RM (Edgar Hudson), W3BWT, Chief RM (Eppa W. Darne). W3AOO has resigned as ORS and RM. The Westminster Amateur Radio Club has call W3BAP. District of Columbia: W3CXL handled WX reports from the Weather Bureau to W4AWO during recent storm. W3BWT is installing crystal. Ed Day is returning to W3ASO. W3IL is getting his share of DX. W3NR will find cool weather more inducive to good traffic work. W3CDQ has been QRL 56-mc. experi-

A.R.R.L. Official Broadcasting Stations

LATEST Madrid dope, current information on expeditions, special tests and activities, new F.R.C. regulations concerning amateur operator's and station licensing, etc., is sent regularly (new information each week) in the different amateur frequency bands by the following A.R.R.L. Official Broadcasting Stations. All stations listed have provided us with latest up-to-the-minute data on their work of sending this information addressed to all amateurs. The list is revised to include only active appointees. The operators of these stations render amateur radio a distinct service. You will find stations in your own district, and neighboring districts in the list. Make a practice of listening regularly for the "QST" sent from one or more of these stations. Report results to these stations when you hear them, so the operators will know their transmissions are successfully received by you and their work appreciated and successful.

W1ABG, W1APK, W1AQL, W1ASI, W1BGT, W1BWY, W1CEK, W1KH, W1MK, W1YU, W1ZS-BZL-II.

W2ACD, W2AKC-AMT, W2AOJ, W2AZV, W2BDJ, W2BGO, W2CBB, W2COI, W2FF, W2OP, W2PF, W2SC, W2UL, W2VH.

W3ALE, W3ANZ, W3AOJ, W3BAK, W3BEY, W3BWT, W3CDQ, W3CV, W3GY, W3NY, W3OO, W3PN, W3QP, W3WI, W3WN.

W4AAD, W4ACB-PCN, W4ACY, W4AIS, W4BFD, W4DD, W4DK, W4KB, W4KP, W4MS, W4NN, W4OI, W4RV, W4UT, W4WS, W4ZH.

W5ACY, W5AFN, W5AOJ, W5ATB, W5AUC, W5AVF, W5AWP, W5AZV, W5BHO, W5BJX, W5CT, W5MS, W5RH, W5UX.

W6ACL, W6AEQ, W6AFU, W6AKW, W6ALU-CDUBRI, W6AMM, W6ATJ, W6AWT, W6BCK, W6BIP, W6BJF, W6BKM, W6BNA, W6BYR, W6CBF, W6CEU, W6CFN, W6CGM, W6CLS, W6CVV, W6CWV, W6CVZ, W6CXW, W6DLV, W6DSP, W6DVE, W6DWH, W6EDR, W6EMK, W6ESA, W6ETJ, W6EXQ, W6FBW, W6FFF.

ments. Maryland: W3LA leads Md. W3CV now has p.d.c. W3CDG is putting in c.e. W3ZT has a dandy 3.5 mc. W3BGI has trouble with his "sky-wire." W3AFF is operating local WTBO. W3ZD handled Madrid Conference traffic. W3JK has gone off to school. W3WN gets out FB. W3BRS is pushing traffic. W3BHE has '10s in p.p. T.N.T. W3CJS has a new power transformer. W3CIZ reports for first time. W3SN is awaiting a power transformer. W3AVD is going back to 3.5 mc. W3DG is getting excellent results in his 56-mc. experiments. W3NY found a few hours to go on 7 mc. Delaware: W3HC has a 56-mc. rig. W3BAK will be back in the traffic line-up soon. W3CPG has good antenna.

Traffic: W3CXL 1196, W3BWT 407, W3LA 145, W3ASO 100, W3CV 24, W3CDG 22, W3HC 19, W3ZT 17, W3BGI 16, W3AFF 16, W3ZD 12, W3IL 9, W3JK 8, W3NR 3, W3WN 3, W3BRS 3, W3BHE 3, W3CJS 3, W3CIZ 2.

EASTERN PENNSYLVANIA — SCM, Jack Wagseller, W3GS-W3BF — W8FLA and WSCFF joined the ranks of ORS. W8FJF will soon be an ORS. W3AKB is back on full-time schedules. W8CVS handled traffic from the American Legion Convention. W3AQN is QRL work. W3OK was heard in Germany on 3.5 mc. W3MC has revamped his whole station. W3AHF tried 1.75-mc. 'phone. W3API is back again. W3BKQ is keeping up the good work. W8EOH is now eligible for ORS. W3BRH reported again. W3QP is making an electron coupled oscillator. W8VD is making a telescope. W8EU put new guys on his pole. W3CHU is old W3BQ. W3CJA has a 7-mc. crystal perking. W3MG is QRL WHP. W3AQW reports for first time. W3AAD is leaving us to go to Bliss Electrical School in Washington, D. C. The SCM is awaiting station license renewal. The following reports were sent in via W3DZ: W3BES, W3BRU, W3BWP, W3JN, W3AQI and W3CFD.

Traffic: W8FLA 481, W8FJF 153, W3AKB 95, W8CVS 93, W3AQN 91, W3OK 67, W3MC 44, W3AHD 42, W3API 37, W3BKQ 37, W3CFD 34, W8EOH 29, W3BRH 28, W3QP 27, W8VD 20, W8EU 19, W3CHU 16, W3BRU 15, W8CFF 13, W3CJA 8, W3BES 4, W3BWP 4, W3BEY 3, W3JN 2, W3AQI 1.

SOUTHERN NEW JERSEY — Acting SCM, Gedney M. Rigor, W3QL — It is with great regret I must report the retirement of W3SM from the field of activity as our SCM in this locality. The whole gang wish him success in his new home in Rising Sun, Md. W3ARN has highest total. W3BEU has a new Jr. operator. W3ACJ is under complete reconstruction. W3ZI is coming on the air with c.c. Listen for W3BWC at W9HZH. W3BYM has new MOPA rig. W3ARV is scratching hard for a new job. W3BPT worked CR7AC. W3BSC is putting in '52s. W3AYA is moving soon. W3AEJ has stray RF in his buffer. W3BFH is suffering his first college razing in Lehigh. W3BBB worked EARA on schedule with traffic from the Convention. W3ANR and W3BEU are operators at WCAM. W3AKI is after an ORS. W3BQC has the rep of putting many on the air and no time for his own rig. W3VX reports taking a gang to North Jersey hamfest, Sept. 25th. W3ZX is working fine DX on 14-mc. 'phone. W3CJV, W3CLG, W3BBK, W3COD, W3AN and W3GU are all new calls. The South Jersey Radio Association is planning a station contest this fall. Write the secretary, W3BEI, for particulars. Everyone is invited to attend the meetings the third Thursday of the month at the American Legion Hall, foot Graisbury Avenue and Lake, Audubon, N. J. W3QL will be on the air the 15th and 16th of each month calling CQ SJ for any ORS in the Section who would like to contact the Acting SCM station for message reports and other information.

Traffic: W3BEI 29, W3ARR 11, W3SM 11, W3ZI 5, W3AEI 16, W3BWC 84, W3BYM 17, W3AYA 3, W3BSC 42, W3BPT 43, W3ARV 74, W3ZX 3, W3BBB 6, W3ANR 8, W3ASG 8, W3QL 10, W3ARN 120.

WESTERN NEW YORK — SCM, Don Farrell, W8DSP — WSGNW, portable of W8AOW, turned in the Section's largest traffic total. This station was operated at the New York State Fair, Sept. 5th to Sept. 11th. The operators were W8QP, W8FOY, W8AOW and W8AED. W8BJO is back from Texas. W8DSS is lining up new ORS. W8GYV, the SCM's portable, was used at the New York State Fair in conjunction with the 56-mc. rig. W8AQF has cancelled all his schedules. W8DBX is finally located in a permanent new

QRA. W8DHU is doing nice traffic work. W8QL is on 1.75-mc. band. W8BFF got laid off again. W8DEQ reports the new Tri-Cities Wireless Association has 43 charter members. W8EWT has been visiting in Detroit. W8DME is on 7 mc. W8FDY is QRL Soccer. W8EUY attended the Convention in Syracuse. W8GWZ reports W8HNV a new station in Rome. W8AYU reports hearing VK3OU working WICA at 4:25 p.m. on 7-mc. band. W8BWY is having trouble with BCLs. W8FTB reports two new hams in Rochester, W8CNW and W8HJT. W8BLR received his first QSL from Germany. W8BLP was QSO 254 foreign stations during the fiscal year. W8BFG is on 3.5-mc. band in early morning. W8BHK reports the S.T.T.A. doing nice work on 56 mc. W8CSW will be on with the call W2QY. W8AFM will soon have all his new transmitters going. W8EKM is now ORS. W8HCD (YL) is second op. W8BLH is checking off-frequency stations. W8BEN took unto himself a wife. W8AKX wants ORS. W8AWU and W8FEJ are using breakin'. W8ACQ built the two complete 56-mc. transmitters and receivers used at the National Glider Meet in Elmira. W8ACQ and W8CJJ operated from early morning until dark each day of the Meet. W8AWH and W8JE should both be ORS. W8EMW is all set for another big traffic season. W8DMJ should have more traffic after he installs his new "Class B" transformers. Hi. W8CYG is district N.C.S. for A.A. Net. W8GWT has been QRT waiting to hear if he passed his exam. W8GUJ is leaving on an apple picking tour. W8GKY signed up with U.S.N.R. W8AVI heard a bunch of west coast stations on 7 mc. during the eclipse. W8FFU received his first class ticket. W8DWJ is trying to find space to put up a 1.75-mc. fundamental antenna. W8GZS reports for first time. W8GZM is using MOPA. W8APU is building new a.c. receiver. W8BOM is back in Montreal at medical school. He will be operating VE2CP. W8AGS has been busy building a new crystal-controlled job. W3CDQ, Miss Elizabeth Zandonini and her sister, Miss Marie Zandonini, were guests of Mr. and Mrs. W8DT during the Convention in Syracuse. W8GWZ has portable call W4PAU. W8AWX is QRL school. W8BYD-W8ZAAQ has been busy with the YLs while on his vacation in Jamestown. W8ECF is rebuilding. W8FLX will be operating from WIVK this winter. W8HKE has a new crystal job.

Traffic: W8GNW 616, W8BJO 435, W8DSS 218, W8AOW 209, W8GYV 196, W8AQF 121, W8DBX 82, W8DHU 70, W8QL 45, W8BFF 44, W8DEQ 37, W8CJJ 35, W8EWT 32, W8DME 20, W8FDY 16, W8EUY 12, W8GWZ 10, W8AED 8, W8AYU 7, W8BWY 5, W8FTB 5, W8BR 4, W8DSP 4, W8AGS 3, W8BLP 1, W8AWH 525, W8JE 409, W8EMW 122, W8BOM 58, W8DMJ 35, W8CYG 35, W8GWT 11, W8GUJ 8, W8GKY 6, W8AVI 5, W8FFU 4, W8DES 45, W8HKF 44, W8FLX 9, W8ECF 31, W8ZAAQ 20, W8AWX 3.

CENTRAL DIVISION

KENTUCKY — SCM, Carl L. Pfleum, W9OX — Thanks for the good wishes and big turn-out, fellow W9JL easily leads the state. W9BAZ is in hospital with a bum knee. W9BWJ has applied for portable license. W9DGN and W9HNV have new crystal rigs. W9CRJ has joined A.A.R.S. A '10 rig is giving W9BOZ good results. W9DNL has returned from Calif. Missouri loses and Ky. gains a good station in W9BJA. The BCLs are suffering from W9DQC's 'phone. W9DLU is building a 500-watt c.w. job. Watch W9JYO, W9FZV and W9HAX's traffic totals climb. Nes masta put W9QT in bed. W9BAN has trouble finding traffic. W9DKD installed a 50-watter. W9EYW is sporting a net-d-b mike. W9HCO is putting in 50-watt Class B modulator. W9ETD and W9FZL are traffic-handling 'phones. W9EQ0, W9CKH, W9GGB, W9ARU, W9AYH, W9ERH and W9CDA are almost finished with new transmitters. W9ELL, W9AUH, W9ALD, W9CTZ, W9JJP, W9FQO and W9JPD are working on 56-mc. U.S.N.R. outfits. W9OX has new e-c frequency meter and will gladly give check on any station's frequency. A new receiver is giving W9JMR most hum. W9CMU has new 75-foot tower. Cooler weather has put W9LH and W9AMQ in form again. W9FQQ buys new crystals to avoid QRM. W9IFM wants ORS. W9FRF has received renewal ticket. W9BOI is ready for business. W9AZY is on with 50-watter at new QRA. "DX on 14 mc. is best for many months," says W9CIS. W9BOF is back

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home. W9JVA is on nightly. W9CEE is working 7-, 3.5- and 14-mc. bands. W9DFN has moved to Richmond. School claims W9ABV. W9BAS has been appointed RM for northern Ky. district. Lightning Calculator keeps W9BNE busy. W9JL is new OO. W9CJZ wants more report cards. W9EOM visited Louisville, Sept. 11th. Report received from Greenville, W9—7, call illegible.

Traffic: W9JL 222, W9DKD 82, W9OX 78, W9FZL 31, W9BAN 18, W9CNE 18, W9ETD 15, W9FQQ 14, W9BOF 12, W9AUH 10, W9BAZ 9, W9HCO 9, W9ERH 9, W9YJO 6, W9GGB 6, W9EYW 5, W9BOZ 5, W9GJZ 4, W9EQO 3, W9FZV 3, W9HAX 2, W9CIS 2, W9LH 1, W9JMR 1.

OHIO — SCM, Harry A. Tummonds, W8BAH — District No. 1: RM W8BYD. W8DAT is putting in a '10. W8CIO has a schedule with WTAHF. Scheduled being lined up reports W8FXH. W8DIH schedules W8BYD. W8FGP is new ORS. W8BAH QRL attending Convention. W8EBY is a regular ORS. W8BYD is organizing a high school and college network. W8DDS may have charge of the A.A.R.S. Net in this District. W8CQF is about set for regular schedules. W8CGO is new reporter. Hay fever predominates over radio at W8GUL. Watch the reports from W8CEJ. W8BMX is back on the job. W8RN is puddling around Lake Erie. W8FSS is on 3850 kc. W8BRB will have new MOPA. W8DQI is member ROWH. W8EFW was busy on eclipse tests at Case School. W8DGP did fine work with WIEKL. W8FFM reports that Lakewood Radio Club has some FB new club rooms. Our heart-felt sympathy to W8GME on the death of his father. New rig on 7110 kc. at W8FGC. "Trying to get HUM out of AC receiver," says W8FNX. W8ACZ says W8HC is candidate for Director. W8FHE is moving to new location. W8BUD has new 14-mc. phone. W8BZG schedules W8BWK. W8UC has nice total. W8ZZB took the 'phone exam. 50-watt Crystal at W8BFT. W8AOJ wants to buy some ten-dollar bills cheap. W8BNC is back at Case School. W8CIY got engaged to YL, mashed car up, pole came down, blew 250-watter and lots more. W8FVL has a new rig. W8FFK is operating on 3622 kc. District No. 2: RM W8BKM, W8HKM is replacing battery with AC. W8BDB reports activity at Scout Camp at Geneva where portable W8GMN was in operation. W8BDB, W8GMN, W8GBH, W8EJY and W8GGF were the operators. The Geneva High School Radio Club, W8GSY, has started to hold meetings. W8BKM has been busy on A.A.R.S. District No. 3: W8BTT blew a power transformer. W8BZD reports for the Maumee Valley Radio Assn. and reports the traffic handled for W8ATN, W8BZD, W8ESV and W8EV. W8EKJ reports new ham in Edgerton, W8ASL. W8CMY visited the SCM. "Will soon be holding 60 or 70 schedules," reports W8APC. Those taking active parts in the Maumee Valley Club work are W8ARF, W8EV, W8ATN, W8DCK, W8BZD, W8EYP, W8APC, W8GRW and W8CLH. W8ESN and W8GZ visited W8GZ. District No. 4: RM W8EEQ. W8OQ says depression has him down. W8GXQ promises a return to traffic. "I want to be an ORS," says W8FBC. W8QQ is looking for cold WX. W8HSG has nice report. Football and school keeping W8HT busy. Report by radio came via W8FDV who mailed it from Cuyahoga Falls. RM W8EEQ is setting the pace for his district. District No. 5: RM W8DFR. We are glad to hear from W8EXI. RM W8DFR is back on air. A nice letter from W8BMK. Here is a new ORS who starts by leading his district, W8FGV. District No. 6: RM W8BBH. W8HEY is a real reporter. W8GZ has a nice report this month. "Consistent" is the word for W8BBH, RM. District No. 7: RM W8VP. W8ANS is back again. W8CKX is on 3507 and 7014 kc. RM W8VP has a real total. District No. 8: RM W8CGS. W8CGS says W8AXV visited him and borrowed the "world's worst receiver." "Will be on regularly," reports W8GES. W8ALQ is waiting for the RI to give him a ham ticket. "Back on with a 211D c.c.," reports W8EHN. W8BRQ handled message from China. W8CUL is going great. District No. 9: "More each month," reports W8FRV. "QRM and QRN terrible," reports W8VR. Rebuilding for fall traffic work at W8EQB.

Traffic: W8DDS 624, W8VP 498, W8BYD 318, W8BBH 208, W8EEQ 178, W8EBY 166, W8FGV 115, W8CKX 93, W8BMK 87, W8BAH 87, W8CUL 62, W8APC 53, W8FGP 50, W8DIH 47, W8FXH 45, W8BKM 45, W8DTW 45,

W8BDB 53, W8CMY 41, W8BRQ 31, W8GZ 27, W8CIO 25, W8DAT 22, W8FFK 19, W8DFR 16, W8FVL 15, W8CIY 14, W8BNC 14, W8AOJ 13, W8HT 11, W8BFT 11, W8ANS 10, W8ENH 10, W8EQB 10, W8ZZB 9, W8HSG 7, W8VR 7, W8SQ 6, W8UC 6, W8BZG 6, W8HEY 5, W8ACZ 5, W8BZD 11, W8ATN 8, W8ESV 1, W8EVS 1, W8EKJ 5, W8FNX 5, W8BTT 4, W8FBC 4, W8FRV 4, W8EXI 3, W8FGC 2, W8GME 2, W8FFM 2, W8EFW 2, W8DQI 1.

WISCONSIN — SCM, Harold Kurth, W9FSS — The SCM has been visiting hams around the state. W9AUX sends in a large report. W9DKA went back to high school. W9DXV has built a new frequency meter. W9FAV received a heard report from New Zealand. W9IAQ-ZZN is working all bands. W9ERS-GAF are husband and wife. W9HMS is using break-in c.c. W9FAF blames his late report on the YLs. W9JDP finds 3.5 mc. good. W9EEQ is trying 56 mc. W9EYX sure looks hot in his Naval uniform. W9HTZ wants to see *Badger News* published again. W9IQW worked all districts. W9DXI is putting 50 watts into a WE211E. W9VD burned out his crystal. W9EOJ worked a "J." W9ESZ's 50-watter burned out. W9ZY says the gang is still vacationing. W9BIB is a sailor on a windjammer. W9GHN is a dentist. W9HKL is building a static-inhaler. W9JMF sends his first report. W9AVG hopes good c.w. conditions will return with prosperity. W9DJQ attended the air meet at the Air City. W9BFM is on 14 mc. W9EYC and YL are building a receiver. W9DGW is on the beach at Cedarburg. W9EAR got a new meter. W9BCV is a new ham at Beaver Dam. W9APO is putting in c.c. W9HDT is a high-power ham. W9EBI is waiting for B-eliminators. W9GIL and W9HBH have increased power. W9JCF took the Comm'l. exam. W9ARM promises to be on air more this winter. W9AQU has an 8-lb. junior opr. W9EHD tells of his marriage to W9GTT. W9HFL won the Lucky Strike Audition by playing his banjo. W9SO is awaiting station license renewal. W9KCP will be on with spark coils for power. W9GVL is getting under way as Route Manager. The Milwaukee Radio Amateurs Club held its first meeting, Sept. 15th. The Burlington Club is preparing for the busy winter season. A new club is the Sheboygan Radio Amateur Club. W9JPL is on 7 mc. W9HNX, W9AUX and W9JXU are on 3.5 mc.

Traffic: W9FSS 14, W9AUX 110, W9DKA 52, W9DXV 42, W9FAV 39, W9IAQ-ZZN 27, W9HMS 21, W9FAF 14, W9EYX 13, W9JDP 14, W9IQW 11, W9DXI 11, W9DV 9, W9EEQ 13, W9EOJ 8, W9GHN 3, W9ESZ 7, W9HKL 3, W9BIB 4, W9ZY 6, W9HTZ 11, W9GVL 16.

INDIANA — SCM, A. L. Braun, W9TE — W9BKJ leads in traffic. W9ESU is new RM. W9ABW has been QRL. W9AEB has '66s. W9AET resigned as ORS. W9AKJ is FBOO. W9AOO is going to build a c.c. rig. W9AXH is working real DX. W9AXK has W9CVH as call at Purdue. W9BPW wants ORS. W9BXT is ready for traffic. W9CHA has new receiver. W9CKB and W9YB are looking for schedules. W9CKY moved to West Lafayette. W9DHJ is rebuilding. W9EGE worked Europe. W9EXL has new MOPA. W9FKE is on the air. W9FO is QRL. W9FYB is new OBS. W9GFS has been visiting hams. W9GGJ is ready for A.A.R.S. schedules. W9GHE is new ham in Clinton. W9GYB is an op at W9YB. W9HIU changed to a pair of 211Es. W9HKH is doing FB with traffic. W9HPQ wants ORS. W9HUO moved. W9HZH reports. W9IMT has new rig. W9IQU is QRL sickness. W9JFA is QRL school. W9JHY has portable W9ZZBO. W9JSR reports for the first time. W9JZA sent in picture of station. W9RS has 50-watt c.c. rig. W9EPT is new ORS. W9JZP gets out FB. W9CXQ operates with a note that beats any concrete mixer. W9HSD competes with W9CXQ. W9AEA and W9DNQ are QRL work. W9HLA and W9AXK are roommates at Purdue. W9JNH had W9HIU report for him. W9IFR, W9JOF and W9JXQ are new hams at Seymour. W9HLQ is awaiting cooler weather. W9CWO, W9KG1 and W9KGU are new hams at East Chicago. W9AQD uses c.c. now. W9ABB opes W9AQD. W9CTV has been doing FB on 56 mc.

Traffic: W9BKJ 37, W9DHJ 32, W9JSR 22, W9ESU 20, W9HKH 17, W9TE 13, W9RS 10, W9AET 9, W9AXH 6, W9HPQ 6, W9CHA 5, W9FKE 5, W9JFA 4, W9CKB 2, W9GFS 2, W9AKJ 2, W9GGJ 1, W9FYB 24, W9YB 34.

ILLINOIS — SCM, F. J. Hinds, W9APY-WR — RM

NW Section, W9ERU, E. A. Hubbell; RM NE Section, W9DDE, Ed Wilcox. Congratulations to our high traffic man W9ALW. Schedules with W9JJN at the Whiteside County Fair Grounds helped W9ALW. W9IYA took his lone message from W6GJA. W9DCI, W9DFH, W9GES, W9ABA, W9HAW, W9KHD and W9KHG all live within two blocks of one another. W9DXZ is arranging schedule with the Dallas State Fair. W9KHG and W9KHD are newcomers in Kenilworth. W9AAK has a new monitor. W9ILG and W9FRA are out to push traffic. W9KX's dad has decided to run a.c. to the house. A new P.P. at W9KCT. W9IPV, W9IVU and W9JOO have new Zeppes. W9FOD was heard in England. W9GPH and W9IWY are installing crystals. W9HQH's receiver has gone haywire. W9CEC is on 3.5 mc. c.w. W9KDQ is new ham in Galena. W9IVF is doing fine work. W9BYL has unlimited "phone license". W9HUU enjoys his ORS. W9BLA is op at W9BC. W9FKO is doing fine A.A.R.S. work. W9OQ, W9EGL, W9CKM, W9AND and W9GFY did splendid traffic work at the Ogle County Fair under the call W9BYF. W9JLK announces new Central Illinois Radio Club at Bloomington with Mr. Carruthers, an ex-British Army op, as code instructor. W9CEO is back on 3.5 mc. W9BLE is another old-timer. W9KCF is the portable of W9IVG. W9KCF is getting W9FOV at Morton High School started. W9CJN wants accurate check on his crystals. W9BTT is on for traffic. Portable W9JJN used at the Whiteside County Fair belongs to W9BTT. W9ALW uses TPTG. W9ILY says 7 is better than 3.5 mc. W9GDI is getting out fine on 1.75 mc. W9CSB is knocking down the "6s." W9CZL and W9AVB are rebuilding. W9AFB is building new c.e. rig. W9GAI will use new call W9FF. W9DPD has been working on school station W9EGZ. W9BYZ is working on new transmitter and receiver. W9HSG copied a QST from W4PF giving storm warnings for the recent Florida hurricane. W9JX and W9ITL getting parts to build a "10 PP for 'phone. W9GPH visited a number of Chicago hams. W9EGH has a "depression" receiver. W9EMN likes 3.5 mc. W9BRX worked a ship in the Harbor of Pisco, Peru. W9IEP returned from Michigan. W9VS and W9WR are changing QRAs. W9UCH is cleaning house. W9DOU was appointed NCS for 6th Corps Area A.A.R.S. W9VM is moving to Oak Park. W9IBU blew the filter. W9DBO was W9EGA's last QSO before the latter moved to Lombard, Ill. W9IEP works break-in with W9DBO. W9JCK has new antenna. W9EKZ is doing splendid work in spite of total blindness. W9ACU is ready to start Trunk "K." W9BSR is at the University of Chicago. W9FO is using a 7052-kec. doublet antenna with W6AM type feeder blocks. W9IJA is ready for a big year. W9NN is forcing 320 watts into a pair of '52s. W9PG-W9RN is a newcomer. W9KA is moving again. W9CUH has BCL worries. W9CNC is now at the U. S. Naval Academy at Annapolis, where he uses W3ADO. W9JO works VK5HG every Saturday. W9CEO attended the Hannibal (Mo.) Convention. W9FCW is alternate SNC in A.A.R.S. W9FJB says traffic handling is better than chasing DX. W9CKM says their club is very active. W9ALA worked his first VK. W9DZG is installing crystal. W9BPV has gone YL crazy. W9FXE says DX promises to be better this winter. W9FYZ is trying to cook up some traffic. W9HPK says when he has traffic, nobody wants it. W9FTX and W9BIR are on 7000 kc. W9GEP is getting bugs out of new MOPA. W9GJJ is back from oping on the boats. W9AAR is experimenting with a.c. receivers. W9FGD says schedules are picking up. W9BPU says the club is growing. W9BVP says 3.5 mc. needs more good operators who will QSL. W9FHY was at the key at W6ADP when W9FKC worked the "6." At the Chicago end, the signals were put on the telephone for the folks and YL of W9FHY.

Traffic: W9ALW 510, W9JJN 293, W9BVP 94, W9BTT 90, W9HVA 86, W9BYF 85, W9DOU 86, W9DBO 81, W9AFB 72, W9CGV 67, W9FJB 65, W9HSG 54, W9CJN 41, W9BYL 34, W9NN 34, W9APY 33, W9CSB 32, W9AFN 31, W9FCW 31, W9FKO 30, W9IVF 29, W9ALA 28, W9AAR 26, W9DXZ 26, W9FRA 26, W9IEP 26, W9WR 26, W9ACU 24, W9HUU 24, W9LW 23, W9BIR 21, W9CUH 20, W9CKM 18, W9AMO 16, W9ABA 15, W9KA 15, W9FGD 14, W9FKC 14, W9EMN 13, W9HQH 13, W9EGA 12, W9HCI 12, W9CEC 11, W9ENH 11, W9IVU 11, W9AZI 10, W9AVB 9, W9BYZ-W9DZG-W9ILG-

W9JCK-W9JO 8, W9BTU-W9GJJ-W9IJA-W9ILY 6, W9ACE-W9FTX-W9FYZ 4, W9AAK-W9DDE-W9DPD-W9GDI-W9HPK-W9IPY 3, W9FO-W9ICN-W9ILH-W9IVG-W9KCF 2, W9BPU-W9BSR-W9HUX-W9IUF-W9IYA-W9JLK 1.

MICHIGAN — Acting SCM, K. F. Conroy, W8DYH — The new Mrs. and W8DYH thank the gang for all the good wishes. Gratiot County Amateur Radio Assn. has been formed with H. Vandercrook as Activities Mgr. W8DED is ready to bat out the traffic. The following are darned good "newcomers": W9EVI-W8GUC-W8IN-W8EVJ-W8GBB-W8CPY - W8FTV - W8BTR - W8AYO - W8BEP - W8ABH - W8GMB - W9HXB - W8BIU - W8BRL - W8HTA - W8KY - W8QBB - W8GQS - W8EHD - W8CST - W8EGL-W8FLQ-W8GNTN-W8ECN-W8CSR and W8QT. W8EGI is new Jackson A. R. A. traffic manager. W8ECN relayed 58 messages in Army "carrier pigeon-radio" maneuvers. W8CST is our newest ORS. W8EHD and W8CUX are working together. W8GQB thinks it would be easier to grow ducks in the parlor than to get W8AF and W8FGW to report! W8KY is going to knock W8HOT off the Selfridge Field "High-trafficker" throne. W8BRL forgot to renew! W8BIU is doubling for W8FX while the latter is up North. Nice work, W9HXB! W8GMB is out to give W8PP some hot competition. W8EVJ will start popping soon. Out of nowhere comes W8DHIC in a chain (daily) leading to Hawaii, P. I., and the Orient. W8GBB is moving to Detroit. W8BRS is going high-powered! W8CPY wants ORS and OBS. W8EGF (just married) is QYL. W8DLX is back for the season. W8DOV is at his daily grind. W8AW is pepping up again. W9EVI is in line for ORS. W8GUC: Guess the only way you can help is to send in totals, dope and a few stamps for Bulletin. W8GDR will be blackmailing Tate, thinks us! W8DMS isn't a "dead rat" — yet! W8EFI continues to mimoo the "Bulln." W8FLZ pounds in day-time. W8AYO wants schedules on 1.75 mc. W8BTR is getting better. W8FTV wants to get in net One of DARA. W8HIL handles his with Army Amateurs. W8DHA's new call is W8HA! W8QT is still winding. W8PP tells us that Monroe now has a club. W8CUP reports his first. W8ERX is all hot-cha. C'mon out of your shell, W8DFE. W8EQB reports W8GVN as new in Nonica. W8BEP (ex-W9LL): You get Port Huron organized to club, eh? Ludington Radio Club: Who're your officers? W8COW-W8SM claims that with W8FX as campaign manager for "W8DYH for SCM" we are handicapped! While bumming around U.P. (Mich.) W9ADV, W9EXT, W9FBC and W9CWR bumped into one another in a box car! W8JX, W8HTA and W8QM all report new junior operators. Congrats! W8RX suggests A.R.R.L. hire a symphony (sympathy) orchestra to play funeral marches for all newly married hams! W8WO pushes 'em when not pulling 'em. W8BTK is now at 34860 Sims, Wayne. W8ABH and W8GQS sent us some stamps this time for the Bulln. Sorry we had you as W9GOJ, W9GDJ, W9EQQ and W9GQF cut expenses by reporting on same card! W8AEQ sure has the old A.R.R.L. traffic spirit. W9HK tells weird tales! Say, Grand Rapids, Holland, wants you to stage another Hamfest. W8BMG claims it was not a hair raising maching QRMing him — he doesn't want hair in his eyes! W8AKN handled a 300-word message to State Fair! W8JO: It's about time for that Lansing Radio Club to organize, isn't it? W8CFZ has 70' mast with a red beacon. W8DZ is cooking for himself! W9GJX is married, as is W8GHV.

Traffic: W8PP 539, W8AEQ 289, W8FX 269, W8ECN 221, W8CST 183, W8GBB 97, W8DFE 96, W8HFB 94, W8FTV 93, W8DHC 68, W9FRW 53, W8EHD 48, W8AW 40, W8BMC 39, W9HXB 39, W8DYH 38, W8CPH 36, W8WO 36, W8QT 33, W8BTK 30, W8EGI 30, W8HTA 30, W8BIU 27, W8BRL 24, W8GQB 23, W8CPY 22, W8AKN 21, W8BJG 21, W8DED 20, W9HK 19, W8EVJ 16, W8AYO 14, W8DCT 14, W8GTN 14, W8GQF 13, W8NR 12, W9CE 12, W8DLX 11, W9IJH 11, W8AUT 10, W8BXJ 10, W8CUX 10, W8JO 8, W8EVJ 8, W8AZQ-W8CUP-W8ERX-W8GP - W8GQS - W8IN - W9CGP - W9HSQ 7, W8BTP-W8FTW 6, W8EFI-W8FCU-W8UD-W9GDJ 5, W8ARR-W8ABH - W8DZ - W8EYH - W8FRI - W8GQG - W8GMB-W8JX-W9DPQ-W9EXT 4, W8AJL-W8AUB-W8BRS-W8FLQ 3, W8AAF-W8BEP-W8DDO-W8DMS-W8DVQ-W8FWG-W8QM-W9ADV-W9EEM-W9IAO 2, W8BV-W8CFM - W8DNY - W8FLZ - W8FXB - W8GDR -

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or
W8GRN-W8HHQ-W8HL-W8WR-W9CWR 1, W9DAB 15,
W9FSK 50, W9IHM 15.

DAKOTA DIVISION

SOUTH DAKOTA — Acting SCM, Stanway Gough, S W9DNS — W9BLZ sends the best traffic report received in four months. W9DJN is looking for local schedules. W9GQH and W9DJN received a visit from W9BAE. W9EES is installing c.c. W9BJV has a new 40-foot Zep. W9FMP has a good schedule west. W9FOQ has a hard time keeping the woodpeckers from sawing off his antenna poles. W9ALO claims to have the largest antenna system in the Dakota Division; he has a total of 436 feet of solid copper wire. W9DNS is building an all-wave super-het.

Traffic: W9BLZ 307, W9IEK 61, W9FMP 26, W9JLA 8, W9HHW 7, W9ALO 1, W9DNS 2, W9FOQ 1, W9HSH 1. NORTH DAKOTA — SCM, Wm. A. Langer, W9DGS- W9WGY — W9GRE of Minot reports for the first time. W9EVQ had trouble with his skywire. W9HJC resumed his OB at 6 p.m. on Tuesdays and Thursdays. W9IGR and W9BPM are ORS applicants. W9AZV spends what time he can spare from school work on 7 mc. W9CRL resumed A.A.R.S. schedules. We received good letters from W9DIW, Grand Forks and W9KBE of Fargo. W9DM has his transmitter rebuilt to c.c. The SCM is again using W9IFW call. W9BP's fine total leads the state.

Traffic: W9BPM 151, W9DGS 96, W9GRE 77, W9EVQ 68, W9HJC 55, W9IGR 13, W9AZV 4, W9CRL 1, W9DIW 2. SOUTHERN MINNESOTA — SCM, H. Radloff, W9AIR — The Southern Minnesota Convention at Mankato was a gratifying success and of material benefit to the Section. W9HCC is consistent contender for BPL honors. W9BKK is key station for the So. Minn. QSP Net. W9FJK offers Handbooks to the high stations in Origination, Relay and Deliveries for the next three months. W9BN keeps twelve daily schedules. W9EPJ is organizing the So. Minn. QSP Net. W9BNN is A.A.R.S. 2nd Dist. DNCS. W9CYX is all set for traffic. W9JBA enjoyed his first ham convention. W9CSY holds portable call W9KHS. New addresses: W9LN 2013 Harriet Ave.; W9DH, 3611 Russell Ave., N.; W9FMA, 5744 Pillsbury Ave.; W9IAK, 3132-43 Ave. S; all in Minneapolis. W9AIR thanks the gang for the token presented him at the Mankato banquet. W9FCS holds portable call W9FVQ. W9DEI says convention helps his DX. W9CTB is installing airplane radio equipment. W9IXQ reports his pal, W9FBV, on the road. W9JEQ wants to do away with his WE21E. W9HMV and W9IOD got their Amateur First Class tickets. W9IKL has c.c. on 3.5 and 7 mc. W9GUX hasn't called CQ in a year. W9CSJ has a new plan for obtaining economical plate power. W9FFY pursues research in r.f. chokes. W9GLE regrets missing the QSO Party. W9JHG wins the Handbook offered in the Minnesota QSO Party, held Aug. 28th. W9IJN worked a CM6. W9EPD reports the gang stopped at WCAL to trade for 50-watters! W9HZU has one of them, too. W9BTZ is President, W9EGG Vice-President, and W9BNN Secretary-Treasurer of the reorganized S.M.R.A. W9IDF gets out with a '45. W9KDI wants more conventions. W9EYL is working on 7200 kc. Lt. (jg) Harvey Wahl, U.S.N.R. Com'dr Section 7, was at Rochester to administer VCR matters. W9COS and W9FNK have a unit lined up there. W9BKX wins promotion to Corps Area Radio Aide for Operations in the A.A.R.S. W9ELZ rebuilt to 50 watts. W9EVG reports W9JLV now located in Minneapolis. W9INS and W9HDH of Iowa visited with W9ATP. W9FPY changed QTH to Worthington. W5PJ of Dallas visited at W9EFK. W9GBZ leaves for Marquette University. W9AKN reports DX good on 14 mc.; W9ELA agrees. W9DGE tells of well-known Minneapolis 'phone using a lingerie stand for mike support. Hi. Mrs. W9CPP and W9DRG's sister both pound brass. W9DMC finished new receiver. W9AFR is working for WU now. W9COS reported at last minute.

Traffic: W9HCC 530, W9BKK 374, W9FJK 215, W9BN 155, W9EPJ 134, W9BNN 70, W9CYX 47, W9JBA 46, W9CSY 38, W9LN 38, W9AIR 39, W9FCS 33, W9DEI 31, W9CTB 31, W9IXQ 28, W9JEQ 19, W9HMV 9, W9IKL 8, W9GUX 8, W9CSJ 7, W9FFY 5, W9FMA 5, W9GLE 4, W9DH 3, W9JHG 3, W9IJN 3, W9EPD 2, W9HZU 2, W9EGG 1, W9IDF 1, W9KDI 1, W9EYL 1, W9VKX 1, W9COS 1.

NORTHERN MINNESOTA — SCM, Palmer Andersen, W9DOQ — W9BBL took traffic at the State Fair. W9BRA has new rig. W9HCV has portable W9BCH. W9AVZ reports a club being organized on the Cuyuna Range. W9HIE spends 70% of his time "rag chewing." W9BHH is reporting again. W9HRB operated at the Minnesota State Fair, along with W9BBL, W9DJW and W9BVM. W9JIE uses all 47s. W9GWR has moved to 7 mc. W9IPN wants an ORS. W9DPP is working Duluth 'phones. W9IAA has a nice total. W9HCW had an enjoyable visit with W9COS. W9HDN says the DX QSL cards don't come in. W9IPA reports CGN back on the air. W9HNS has improved in health. W9JJS built a new a.c. receiver. W9FNJ says 3.5-mc. QRN letting up. W9HEN has been helping W9CWI check the off-frequency boys. W9FEP was visited by W9BHQ. W9BGG looked up the gang on his public address tour. W9HZ brings trunk line to Duluth and the Range.

Traffic: W9FNJ 15, W9DOQ 33, W9BRA 24, W9BBL 181, W9HIE 73, W9BHH 2, W9HZ 22, W9HEN 6, W9BCH- HZV 21, W9AVZ 72, W9HRB 81, W9JIE 61, W9IPN 11, W9DPP 3, W9IAA 162, W9HCW 99, W9HDN 11, W9IPA 20, W9JJS 104, W9FEP 5.

DELTA DIVISION

MISSISSIPPI — SCM, William G. Bodker, W5AZV — W5BUI is correspondent for the new fifth district publication "Sparks." W5CCA reports for the first time. W5CLD worked a VE4 with low power. Our RM W5ANX had some trouble with a two-frequency crystal. W5BZG is awaiting the construction of a new power line. W5VJ reports having calmed the ruffled feelings of several nearby BCLs. W5UM says college QRM will put him on the shelf. W5AUB has a 500-watt c.c. job ready to take the air. W5AWP is busy repairing BCL sets. W5AZV completed two new single wire Hertz antennas. W5BOT and W5BNW are attending college. W5BXZ is in Los Angeles looking for a radio job.

Traffic: W5AZV 40, W5ANX 20, W5CLD 14, W5UM 9, W5VJ 3.

ARKANSAS — SCM, Henry E. Velte, W5ABI — W5BMI and W5BED are for high "traffickers." W5BUX reported for the Pine Bluff gang. W5GN did same for El Dorado. W5BZE has moved. W5SI has new 100-watt c.c. job. W5BUX was heard by a ZL on 3.5 mc. W5CNK was QSO J1HX! W5BRI and W5JK report. W5CR reported by radio. W5ABL, W5BUX, W5SI, W5PX, W5VK are all c.c. W5BDW has moved to new QRA. W5CCY is using type '10s.

Traffic: W5BML 145, W5BED 143, W5ABI 84, W5BUX 18, W5JK 17, W5CCY 15, W5VK 3, W5CNK 8, W5CR 7, W5ABL 2, W5PX 2, W5GN 1.

TENNESSEE — SCM, James B. Witt, W4SP — W4AMD attended the Hamfest at Bluefield. W4APF motored to Atlanta and passed exam. What would W4ABX want with his rig if it wasn't for the YL down Fla. way? W4AFF will soon be on. W4BGQ has new MOPA. W4HA has new transmitter. W4TM reports a new YL op born July 20th. W4AAD is going on the air with a c.w. signal soon. W4ADX reports several active stations in Johnson City.

Traffic: W4HA 10, W4DX 7, W4RO 3.

LOUISIANA — SCM, F. M. Watts, Jr., W5WF — Hello, everybody! We're still pounding away. W5AXD is on phone. W5BPV is a newcomer. W5AQO took unto himself a wife. W5BBW is on 7 mc. W5APA is on regularly. New fellow in Minden: W5CMQ, W5COR, W5COG and W5CKC. W5BZR QSOed his first VK. W5QJ and W5HR pooled their equipment. W5BPL is now conditioning his phone. W5KC will be on more often. W5BYX is kicking about the depression. W5AYZ let her license expire. W5AKW has returned to LSU. Ex5AYZ (RGS) has returned to Univ. of Mich. W5BYQ is still hanging around. W5ASJ doesn't call around any more. W5BJA is around town. W5ML and W5AKI wake up. W5WF will be back with you soon.

Traffic: W5HR 22, W5BZR 16, W5APA 5, W5KC 4.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Robert E. Haight, W2LU — W2BJA continues leading the gang. W2UL reports FB DX. W2LU tries new transmitter. W2BVR returned from Maine. W2ANV visited W1AWQ and

W1ANS. W2BJP is heard on all bands. W2CJP is back on 3.5 mc. for winter. W2AEW is on 7 and 14 mc. W2ATM moved to new QRA. W2ACY worked 27 Europeans in 13 days in July. W2BKL built new c.c. rig. W2CJS reports nice visit at HQs. W2DQD delivered a message received from D4AAR with W2BCR aid. W2BUR is priming up. W2DSH and W2DVY made application for ORS. What a sock W2BYP is putting out with that new crystal. W2QJ is our only YL. W2BCR is dragging in foreign DX. W2BZT is sporting new MOPA. Wanted by W2SZ: Schedules every afternoon and Friday and Saturday nights. W2BZZ will be back on shortly. W2CFU reports QSO with EAR185. W2ZZDJ is also W3ZZBH. W2DIY is back on air. W2AUX is using 'phone. The Crystal Radio Club held a Clam Bake Barbecue on Aug. 28th. W2CSC only casualty. W2BCH is undecided what band to operate on. W2DON is pounding through on 1.75-mc. 'phone. W2CTE and W2DFU are in love with 56 mc. W2CSC was heard in Germany on 3.5 mc. W2DIB and W2DIN tried 7 mc. W2BLU resigned his ORS. W2DMH is new ham in Schenectady. W2CQH-W2ZZBF is back on air. W2BMX is back from college. ExW8SG promises activity soon. W2EFM, old-time W2CYO, is pounding out with 'phone on 1.75 mc. W2CVZ and W2DCX also use 1.75-mc. 'phone. W2BLL is QRL school. W2CGO on 3530 kc. contacted F8JR. W2BSH is busy making a second op out of his brother-in-law. W2DEL and W2BKM are preparing to attend VCR drills. W2CTC is heard once again. The SARA station will be on the air shortly with crystal control.

Traffic: W2BJA 172, W2UL 107, W2LU 92, W2BVR 19, W2ANV 17, W2CJP 16, W2BJP 12, W2ATM 8, W2ACY 3, W2BKL 3, W2CJS 2, W2DQD 2, W2SZ 1.

NEW YORK CITY AND LONG ISLAND — SCM, M. J. Grainger, W2AUS — W2COI has been appointed ORS and OBS. Route Manager W2QM has been promoted, and his duties now include that of RM for Manhattan. The Hamfest at Hempstead Lake State Park, on Sept. 11th, was enjoyed by over a hundred hams of this Section. Free eats were supplied by the Nassau Radio Club. W2CY, W2BMH, W2LR, W2LG, W2CZF and W2BST are all after ORS appointments. Manhattan: W2SC is the one and only high station. W2AWT reports from Canada. Staten Island: W2WP reports a new AC receiver. W2AHO leaves for school soon. Brooklyn: W2BRB continues his experiments. W2AZV continues his duties as RM in Brooklyn. W2PF has a new crystal. W2CWP's YL is W2TU. W2DBQ pounds away at the LI trunk. W2ASG is rebuilding. Three new reporters are W2DUE, W2CAU and W2CGL. W2AAP, W2LG and W2BXJ are back on the air. W2CQH sends his first report. W2DRG handles traffic. W2DAL sends in first report. W2DQK reports large total. Queens: W2ADQ wins first place for the Section with a BPL total. W2DMN sends his first report. W2COI is going strong. W2AHZ slipped up to 14 mc. W2BNE now has '52 in PP TNT. W2CJY reports an increase in membership in the Sunrise Radio Club. W2AGL has BCL trouble. W2DAT joined the A.A.R.S. W2AUS has the old '52 back in use. W2DEY is on with low power. W2BDR goes to Iowa for college. W2HN gets out with 'phone on 3.9 mc. Bronx: W2CBB comes across with a total. W2BGO reports things slowed down this summer. W2CYX is getting ready for Navy schedules. W2BMH is a new reporter. W2DYJ reports vacation schedules. Long Island: W2CY wants good schedules. W2CYA is on air again. W2DOG reports traffic. W2VL reports checker games on 56 mc. with the assistance of W2ML, our charming YL from Valley Stream. The Nassau Radio Club now has a transmitter going on 3.5 mc. W2BET worked the Schooner Doris Hamlin in the Caribbean. W2AZ worked four foreign stations on 'phone. W2BST has welcome business QRM. W2DLR runs a radio column in local newspaper. W2LR reports traffic obtained by using a new '60. W2CHK breaks a hundred in traffic for the first time. W2CLM says new transmitter working OK. The SCM will award (for donor) as a prize a crystal or a 1-mfd. 2000-volt condenser to the station which shows the greatest improvement in traffic totals over this month for the month November-December. Results will be reported in *QST*. It is not necessary to be an ORS, but a handicap will be allowed those not ORS, making it even for all. Enter the contest, starting November 15th at midnight. Handle as much traffic

as you can and report it on the 16th of December. Two prizes will be awarded. W2ADQ and W2SC are not qualified to enter because of heavy traffic totals. Any band may be used.

Traffic: W2DBQ 49, W2AZV 12, W2PF 51, W2BRB 15, W2DPU 14, W2SC 292, W2LR 11, W2CY 28, W2AGL 68, W2CHK 101, W2VL 11, W2ADQ 522, W2DOG 18, W2CYX 6, W2BMH 7, W2CBB 55, W2BVB 33, W2DQK 64, W2DAL 4, W2DRG 14, W2QM 26, W2BGO 6, W2AUS 94, W2WP 40, W2AHO 55, W2COI 56, W2DUE 15, W2DYJ 1, W2CFH 2, W2AZ 4, W2CLM 1, W2AWQ 4, W2DMN 13, W2CYM 1.

NORTHERN NEW JERSEY — SCM, Walter A. Cobb, W2CO — W2AGO is our high man; now he has left us for Rensselaer Polytechnic. W2AGX is going to burn up his key when he gets down to business again. W2DQQ passed his commercial exam. A maximum of 2 minutes allows W2AIF to QSY to any frequency. W2CJX cools off with QSO Siberia on 14 mc. W2BYP is keeping up his end of the Section. He, W2CBY and W2DIU are A.A.R.S. A flock of schedules is being kept by W2CGG. A schedule with K5AA furnishes W2AMR traffic. W2DPB operated W3CJQ all summer. W2CIZ heard a CQ followed by his own portable call W2ZZW — he raised the caller and got full dope on his own old QRA!! New receiver intrigues W2DCK. Daily schedule with T15FI, Coconuts Island, is W2ATB's pet. A new reporter from Caldwell is W2BXN. We lose another good traffic man from North Jersey when W2AKC-AMT departs for Florida on November 1st. Moving to a new QRA has floored W2FK. W2DAB is erecting a shack in his cellar. W2ATE doesn't stand a chance to operate account of the OW, his apartment neighbors, etc. WRNY is honored by the presence of W2JJ, exW2ALU, on its staff. W2UY has been imbibing the waters of Greenland Lake. W2CZG had to erect a barbed wire fence around his outfit to keep his youngsters away. Another addition to the family of W2AOG is reported. Congrats! The boys up in Passaic County are pushing W2TP, Jersey's candidate for Director in the November election. Construction of a new rig is keeping W2BNV off the air. Some darn good suggestions on how to run the SCM job are offered by W2BPG. W2PJ sends along some real news of the South River bunch. W2DWN has the idea that 56 mc. is magic stuff. A shiny new receiver is the apple of W2CNI's eye. W2CME has the bad taste to let his work interfere with his operating. W2CBT is still going strong on 7000 kc. W2PJ QRT due to no power supply. While on vacation with W2ZZEL, his portable, W2BAP tried many a time, but blames his QRA for the lack of QSO. W2BPV can't make up his mind whether he should go on 56- or 1.75-mc. 'phone. W2ADP is awaiting the Asian card that will make him WAC. School has claimed W2BIW. W2EHN is walloping a '10 with all he can get. W2CYA has been spending the summer in East Orange. Two fellows in Matawan are new reporters, W2EJK and W2DQE. A total of 40 countries worked this year is the record of W2GT, ex-W2CJA. Research work in the crystal business engages the attention of W2HL, ex-W2CVR. W2WY has a new high level Heising modulated 500 rig. W2WC was heard in Germany on 3.5-mc. band. W2WB is busy in the Naval Reserve. W2CO is actively on the air. W2EHI is the call of the club station of the New Jersey Amateur and Television Association, and is located in the Military Park Building in Newark.

Traffic: W2AGO 219, W2AIF 19, W2CJX 40, W2CNL 21, W2CIZ 82, W2AMT 44, W2BPY 56, W2AMR 44, W2DQQ 43, W2CGG 20, W2ABT 24, W2BXM 13, W2BPG 3, W2EJK 50, W2DQE 60.

MIDWEST DIVISION

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9DI, RM, is starting off for the season. W9DHA, Grand Island, is Assistant RM, taking care of the western half of the state. W9DMY sends in a good report. W9IFE is a new reporting station. W9AZT is going to locate at Boulder, Colo. W9FUW is raring to go. W9HTU is going strong. W9FAM in QRM rebuilding. W9DGL has been working a lot of DX. W9EWO was down to see W9FAM a short time ago. W9EHW is getting ready for the season.

Traffic: W9DI 58, W9DMY 50, W9FUW 17, W9DHA 15, W9FAM 6, W9DGL 3, W9EWO 1, W9IFE 39, W9AZT 24, W9HTU 15.

KANSAS — SCM, O. J. Satter, W9FLG — The Midwest Division Convention in Topeka was a huge success, with a turnout of 170 hams. W9FLG was presented with the Kansas trophy, an exact scale size of the original Wouff-Hong hanging at HQs. CX7 takes all honors with an all-time record. Our hats off to the gang operating W9YAB during camp period. W9HSN handled two death messages with 15-minute service. The SCM was glad to hear from the Parsons gang. The Kansas YL hails from there. W9AWP reports W9ABG a new station in Wichita. W9EDU is working 3500 kc. now. W9BNU won Port Arthur College scholarship offered at Convention. W9DEB is getting set for big U.S.N.R. season. Which reminds us, watch the Kansas A.A.R.S. gang this fall. W9KFQ is using pair '45s with 500 volts. What happened to the Arkansas City gang this month? W9EFE took a trip to Texas to visit his son. W9BPU reports exams at Topeka netted Hiawatha four new hams.

Traffic: CX 7 3620, W9YAB 818, W9FLG 563, W9BDB 415, W9KGK 382, W9EIB 375, W9NI 357, W9DEB 209, W9HTF 200, W9CYV 180, W9CPY 152, W9ZZAP 117, W9AWB 95, W9EVY 91, W5ZZD 70, W9KDO 66, W9BNU 58, W9KCR 57, W9HSN 57, W9CSD 50, W9EPD 49, W9BQV 40, W9IQI 34, W9EFE 24, W9FIW 24, W9ABR 21, W9IGQ 21, W9EDU 20, W9BBM 20, W9AWP 15, W9KGO 15, W9HWW 13, W9GWN 13, W9CXW 5, W9FRC 4, W9COA 4, W9ESL 3, W9BGL 3, W9BEZ 283, W9PB 15.

IOWA — SCM, George D. Hansen, W9FFD — W9EIV, RM; W9BPG, RM. Missouri has challenged us to a traffic duel to start the month following the announcement in *QST*. Let's go!!! W9ABE says things are perking up. W9BWF works schedules in fine shape. W9ACL unfolds himself. W9BPG perked up a little. W9EIV reports trunk line "H" going well. W9AYC wants schedules. W9EOE is another c.c. station. W9HMM is getting into trim. W9FFD resumes AA schedules. W9JZM is a new reporter. W9CS returns from Black Hills and goes c.c. W9JMB erects a new sky wire. W9EMIS reports new ham, W9JCS. W9DUE has ORS aspirations. W9GP gets a few in between conventions. W9CWG was appointed Alt SNCS AA. W9FZO gets a few. W9ERY is lining up some schedules. W9FYC is resuming schedules. W9FEB is on 3.5 mc. W9DMX reports new receiver. W9JXO is another first-timer. W9AHX has portable W6ZBL. W9HOH sent 18 QSLs and received 1. W9CYL had good time at fest at W9FDB. W9DNZ reports new station W9GAA. W9DPO comes through with a lot of news. W9CWQ is still DXing. W9IGH is planning new outfit. W9DLT, W9EUV and W9BIP is still hibernating.

Traffic: W9ABE 370, W9BWF 306, W9ACL 110, W9BPG 84, W9EIV 61, W9AYC 56, W9EOE 40, W9HMM 38, W9FFD 36, W9JZM 24, W9EMS 20, W9DUE 16, W9GWT 74, W9GP 15, W9CWG 14, W9FZO 13, W9ERY 12, W9FYC 10, W9FEB 8, W9DMX 6, W9JXO 3, W9AHX 3, W6ZBL 2, W9HOH 1, W9AFQ 2.

MISSOURI — SCM, C. R. Cannady, W9EY — RM Wm. Atkins, W9TJ. IOWA and KANSAS have accepted our challenge to a CONTEST. The contest BEGINS NOW! W9HNM led the state. W9CRM barely clung on to his seat lead over W9CJR, but losing out to W9FTA by a bare point for the lead in the ACTIVITY CUP race. St. Louis: W9IJW hooked 193 stations in 45 days. W9IJO erected a new antenna. W9BGE received ORS. W9PW helped out in vacancy of RM for Eastern Missouri. ExW9DYZ now holds WSHAU. W9HWE worked B4PB. W9HVJ is planning c.c. job. W9HWD is winding transformers. W9HHK dropped business temporarily. W9TA has new c.c. rig. W9LPL applied for ORS. W9FZJ reports for first time. W9ENI is now at Purdue. W9COD needs a new "B" battery. W9FAB comes back after a year's vacation. W9GCH reports traffic. W9DOE sends FB report. W9GDU received OBS appointment. W9GTK-W9ENK reports too much QRM. W9CCZ is about ready to go. W9ILI is on 1.75 mc. W9KIK is a new ham. W9BH1's '52 gets out better on 7 mc. with TNT. W9HVN is vainly trying for VKs. W9FAB moved to 7 mc. W9FYW operates on 14 mc. W9FWQ is QRL "Collie." W9HVC has nice c.c. signal. W9HUZ shows increasing activity. Kansas City: W9FCF-W9KHT reports. "Job is holding me down." W9RR-W9ZZ reports several K.C. hams at Topeka; also reports traffic for 9NP. W9DQN temporarily resigns ORS and OBS. W9EQC reports schedule with VK3VP. W9AOG-W9KEP changes QRA to

Fayette. W9BMA is experimenting. W9CVT temporarily resigns as O.O. State News: W9DHN is in Columbia at M.U. W9CJB will resume activity soon. W9AIJ reports schedules lined up. W9FJV was appointed S.C.S. for A.A. W9FSL says everything ready for winter. W9KCG is new ham at Cairo. W9JBV sends traffic report. W9ASV and W9CLQ operate WMBH. W9GLY, W9IGW, W9FMV took in the Convention at Topeka. W9DLC reports for the first time. W9ARH reports little DX. W9BGS is getting started. W9HNM says "Let's show Iowa up!" W9BAU is playing football. W9CRM slowed up a little. Hannibal Amateur Radio Club: W9GBC stepped out on traffic. W9HSZ was in Minnesota on vacation. W9HBJ is a 3.5-mc. receiver "specialist." W9EFZ is QRL YL and work. W9, an old-time ham, R. L. Cooper, is coming back. W9CNS still holds to phone. W9IRR spends most of his time in club activities. W9FGJ and W9FSB are not operating much. South Missouri Association of Radio Amateurs: W9GAR and W9CBX are active. W9IGX operates 'phone. W9HUG got the receiver working. W9GBJ worked VK and ZL. W9FVM-W9CON is back in Fayetteville at Arkansas U. W9IXO returned to 3.5 mc. W9FYU returned from the west. W9JYC is a new station in Aurora. W9EHS and W9EY-G-W9HCP-W9JPT are planning to set up at a different QRA. Traffic: W9HNM 171, W9FSL 152, W9EQC 147, W9GBC 117, W9JBV 35, W9HUZ 27, W9EYQ 27, W9FTA 23, W9HCP 20, W9PW 16, W9JPT 16, W9FVM 15, W9HWE 15, W9RR 15, W9AJ 14, W9IXO 12, W9BAU 12, W9CJR 12, W9NP 11, W9ARH 10, W9HVJ 9, W9CRM 8, W9GBJ 8, W9AOG 7, W9JYC 7, W9FYU 7, W9HUG 5, W9KEP 4, W9FEH 4, W9ARA 4, W9CON 2, W9DLC 2, W9Z 3, W9FSZ 2, W9IJW 2, W9BGE 2, W9IJO 1, W9BGS 1, W9EHS 1, W9GCH 1, W9FZJ 1, W9CCZ 1, W9VLR 2, W9HUI 7.

NEW ENGLAND DIVISION

WESTERN MASSACHUSETTS — SCM, Earl G. Hewinson, WIASY-WIRB — W1BCX leads again this month. AJR of W1API is awaiting license renewal. W1AFI is high ORS in traffic. W1AJR reports no depression. H.V.R.C. is reported by W1ACI as having a new club house. W1AZW reports traffic from China. The SRA is at the Eastern States Exposition, W1BWY. W1DGW used a telephone to QSP traffic to W1MK. Hi. W1CCS's request for schedules has got the RM's eye. W1COI reports new ham, W1FAJ. W1RB (old WIASY) is having antenna troubles. W1OF is playing 56 mc. W1CCH is President of the W.M. A.R.A. W1DCD is flirting with DX on 14 mc. W1AUQ reports motor QRM. W1AQW has deserted 56 mc. Welcome to our new ORS: W1DCH, W1EFM and W1CCS. W1AVW of Webster sends first report. W1CGL has worked all districts. W1BKS visited the land of VEs. The Worcester Radio Assn. is now meeting on Tuesday evenings. W1ARH, W1BVR, W1AMI, W1DJQ and W1EOB send in reports. W1BPT sent application for ORS. W1BAP is having his troubles with BCL sets. W1BVP-GP, our RM, is contemplating high-powered 'phone.

Traffic: W1AFI 107, W1AJD 103, W1AZW 53, W1BWY 40, W1BVP 37, W1DGW 36, W1ARH 28, W1CCS 26, W1COI 19, W1RB 19, W1OIF 17, W1CCH 12, W1BVR 11, W1BNL 9, W1DCH 7, W1AUQ 7, W1AQW 6, W1BCX 109, W1AMI 69, W1EFM 47, W1AVW 16, W1CGL 15, W1BKS 12, W1DJQ 2, W1EOB 1.

VERMONT — SCM, Rey L. Gale, W1BD — W1BZD is RM for southern Vermont. W1CGV holds a daily schedule with his brother, W2DQE. W1AOA is again with us. W1DAJ built a harmonic monitor. W1BIP is using low power. W1CGW is at U.V.M. W1CUN is expected back soon. Football leaves W1EFC in poor condition for hammering. W1ATF made observations during the eclipse. W1CGX is QRL service work. W1AXN is the proud father of a YL op. W1BNS, W1CBW and W1EJF are busy with school work. W1EJK is a new ham in Readboro. W1FBK is new in Richmond. W1EGU returned to college. W1BDX keeps busy lending apparatus to other hams. Hi. W1BD is practising with the rifle so he can contest W1ATF's title as the crack sharpshooter of the Vermont A.A.R.S.

Traffic: W1BZD 112, W1CGV 104, W1BJP 29, W1AZV 24, W1BD 18, W1DHX 15, W1ATF 13, W1CGX 12, W1EFC 4, W1BNS 3, W1AOA 1.

RHODE ISLAND — SCM, N. H. Miller, WIAWE — WIALI joined the A.A.R.S. WIELU has five schedules. WICGO is building new transmitter. WIEQF is perking out fine. WIAQ will be on soon with new outfit. WIAOP is going well. WIBTP is starting up for the season. WIASZ reports BCL repair business good. WIBOY cops the high total this month. WIBIL is experimenting with MOPA. WICPV is on daily. WIDOT has had trouble with his filter. WIAFW, WIDFB and WIDMJ are in the Pawtucket 7:30 p.m. 'phone club. WIAAD is building a new receiver. WIBGA is our new Route Manager. WIFAW and WIFBS are new Pawtucket hams. WIAMD and WICJH expect to return to the air soon. WIBIW is on after a long absence. WIDIT revamps his outfit. WIAMU is back in the BC game with a N.H. station. WIALI, WIDOT, WIDFB, and WIEQF started a new radio club in Pawtucket. WIBUX is still working the world. WICAB is on with a new c.e. job. WIAWE is trying to get on with a new c.e. transmitter. WIAFO and WIARK are working in the same BCL store. The Providence Radio Assn. has some good meetings arranged for this winter season. Get in touch with Horace Young, 73 Clarence St., Providence, R. I., for dope. WIBZ-WIII is still going strong.

Traffic: WIBOX 79, WIASZ 22, WIBGA 17, WIAOP 14, WIBTP 12, WIELU 12, WIALI 11, WIAAD 11, WIFBS 7, WICPV 7, WIDFB 5, WICGO 4, WIEQF 3, WIAQ 3, WIDOT 2, WICJH 2.

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1DVG has gone to school. WIBRT is going to try 56 mc. WICVK user remote control. WICCM passed unlimited 'phone exam. WIAPK boasts an Extra First ticket. WIAWL is busy in a grocery store. WICJO is on 7 mc. WIAUY worked Mt. Washington on 56 mc. WIIIP is starting up again. WIAEF's '52 job steps off FB. WIEES tried 14 mc. WIEAK and WIDPZ returned from N.G. encampment. WICBJ is working DX on 14 mc. WIEAY is building a receiver. WIADR is building a bug. WIEAL is on 3.5 mc. WICPM is moving into the house. WICGP is at N.H.U. WIDMI will soon have 1.75-mc. 'phone. W1ELJ handles traffic at WIDMI. WIBAC spent the summer as Hutmaster in the White Mts.

Traffic: WIIIP 25, WIDVG 12, WIDMI 19, WICVK 5, WIEES 4, WIAEF 1, W1ATJ 1.

CONNECTICUT — SCM, Fred A. Ellis, Jr., W1CTI — W1MK makes BPL. WIBFS did another good job for amateur radio in the radio booth at Noank. Operators were WIDWJ, WIEFU and WIFBS. Portable WIEZ was used. WICJD was the hard working RM this month getting out a couple of bulletins to the gang, arranging schedules for 18 stations and finding time in between to handle a total of 206. RM WIAFB has been after action up his way. WIAJB holds down Middletown. WIAOB sends in his first report. WIAMG is going strong. WIBYW is all peped up about the Conn. Net. WICTI is on the air every Sunday, 9:30 to 10:30 a.m., for Conn. QSOs. WIEAP says DX good on 3.5 mc. WIAUK is keeping daily schedules. WICDW reports by radio. WIDOW will fix up his station so he can have more snappy operation. WIASP built a new 56-mc. receiver. WIDBU says WIESD is a new ham. WIQV reports for eleven of the hams in his Section. W9BVF from North Dakota is attending the Coast Guard Academy at New London. WIDFT has 6 embryo hams in his shack most of the time. WIEU sent his report in early. WIBMP handles the Winsted end of the Conn. Net. WIDBG reports traffic total by radio. WIBNB was on the air only week-ends. WIAFW is on the job in Bridgeport. WIBIH plans to operate WIECE at Worcester Polyteck. WIBQS had trouble with transmitter. W1DGG is all set at new location. W1DBP enters Yale this fall. The Twin City Radio Club has a new portable call WIFAF. WIAZP opened up again on 3.5 mc. WICNU went to New York City and got his Amateurs First Class ticket. Official Observer WIEAO reports more off-frequency operation. WIAVB spent most of his time swimming. WIBGT is Official Broadcast station on 1877 kc. (phone). WIAQF says very QRL work. Following report traffic: WIBAX, WIESD, WIDCM, W1DBW, WIDCI, WIBDS, WICUH. WIVU was rebuilt by Bob Wilson. WIEMV reports WIEAY recovering from an operation for appendicitis. WIEEI, an old-timer, is back on 3512 crystal. The following towns are hooked together in the

Section traffic net; if your town is not mentioned, drop WICJD a line. Stratford (WIAFW), New London (WIQV), Elmwood (WIAJP), Bristol (W1DOW), Winsted (WIBMP) Norwalk (W1CTI), Middletown (WIAJB), Hartford (WIAFB, WIMK, WIBDI), Stamford (WIAMG), Gilder-sleeve (WICJD), New Haven (W1BVW, WIAUK, WIVU, WIBHM), Burnside (WIBNP), Noroton Heights (W1CBA), West Haven (W1BYW), Mystic (WIBFS). Special broadcasts of interest to all Conn. operators are sent by WICJD every Sunday morning at 9:30, and at 10:30 by WICL. Shorted transformer and condenser at WICBA. WIFL pulled the condenser apart and spread loose mfd's all over the shack!

Traffic: WIMK 326, WIBFS 251, WICJD 206, WIAFB 149, WIAJ 91, WIAOB 73, WIAMG 68, WIBYW 56, WICTI 43, WIEAP 42, WIEZ 36, WIAUK 22, WICDW 22, WIDOW 20, WIASP 18, WIDBU 16, WIQV 16, WIDCI 14, WIDFT 14, WIEU 13, WIBMP 12, WIDBG 11, WIBNB 9, WIAFP 8, WIBHY 7, WIBQS 7, WIESL 7, WIDBP 7, WIDBW 6, WIDCM 6, WITD 5, WIESD 4, WIDF 3, WIBAX 3, WIAZP 3, WICNU 2, WIEAO 1, WICUH 1, WIBDS 1, WIFL 18, WIEFW 5, WIES 1, WIBZ 3.

EASTERN MASSACHUSETTS — SCM, Joseph A. Mullen, WIASI — The Director of the N. E. Div. and the SCM of Eastern Mass. were received with open arms by the Portland gang at their hamfest. W1ABG has relinquished the reins of RM after a year of excellent work. He is succeeded by W1VS, our crack traffic man. His QRA is 85 Mystic St., West Medford. Get in touch with him for the new E. Mass. traffic net schedules. WIAFB has landed a ship job. WILM is back on the air. WIBW has returned from a vacation in Canada. W1CHR was away on a cruise. WIAWX, WICVA and WICQN are going back to school. WICUO is still rolling along in free wheeling. WIBFR is rebuilding. WIME says all is quiet. WIAAL has finished his overhauling. WIBMW turns in a real ORS traffic total. W1SC is all set for a big season. WIELL is 56 mc-ing with WIELF and WIEQO. WIDAI is pounding across the pond. WIEQH is a new man in Newton. WIDOF reports for the first time. WIESE signs off for the winter. WIALP visited HQs while on vacation. In romps W1JL after a 6-yr. QRT. W1DZG finally got a report in to the SCM. WIAOV is busy with school. Will the club secretaries please send to the SCM all the dope about their clubs as well as their own QRA?

Traffic: WICVA 95, WIVS 69, WIKH 49, WIASI 47, WIBMW 42, WIAAG 38, WIESK 37, WIABG 35, WISC 35, WIAAL 18, WIAFB 14, WIME 14, WIDZG 14, WIJL 10, WIDOF 9, WICUO 7, WIBBY 5, WIAWX 4, WICQN 4, WILQ 8, WIAK 3, WICHR 1, WICCP 26.

MAINE — SCM, John W. Singleton, WICDX — WIBEZ wins the wall sign for being high traffic man this month. WIBOF kept most of his schedules going all summer. WIDJ is among the leaders. WICDX spent vacation in Norway. WIBLI has some nice schedules. WIDHE is now in Orono, attending U. of M. WIAQW has his usual fine total. WIAFP puts out a nice signal. WIBGZ blew rectifier and filter. WIEF is going strong. WIBEU is very busy. WIEY has been having transmitter trouble. WICFG is all set for Trunk Line schedules. WIAJX is back to hard labor in school. WIDAW and WIBNC send first reports. WIDHH will be more active next month. WIEJS and WIDFQ send us reports. WIBZS is back on the air. WIAQL spent two weeks in Army camp. WIBFZ, WIFQ, WIAIK and WIAUC were also there. WIBWB and WICEQ have been experimenting with 56 mc. WICRP is alternate control for Trunk Line schedules. WIAATO reports traffic.

Traffic: WIBEZ 207, WIBOF 99, WIDJ 80, WICDX 78, WIBLI 65, WIAQW 57, WIAFP 44, WIBGZ 24, WIEF 21, WIBEU 18, WIEY 17, WICFG 14, WIAJX 14, WIDAW 14, WIDFQ 13, WIDHH 8, WIEJS 6, WIBNC 1, WIBZS 1, WIAQL 1, WIAQI 19.

NORTHWESTERN DIVISION

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7BAU's big bottle works fine on 3.5 and 7 mc. W7BAU is rebuilding. W7ACD is "courtin'" by 3.5-mc. 'phone. W7BKA keeps one schedule. W7BRU promises to report every month. Thanks to W7CHN for the very nice report. W7BRD hopes to get a schedule with W8UQ. W7BEO has a "crew",

of four ops now. Who is guilty of the theft of W7ACO's rectifier tube? W7AJQ says 7-mc. conditions are very punk. His statement is confirmed by W7ALW and W7QD. W7BYX blew his rectifier. This report in the "swan song" as SCM for W7AKZ. W7AYH has been elected to the job for the next two years. To those hams who have helped me so much during the last two years I extend sincere thanks and a hope that they will continue to assist the new SCM in the same fashion.

Traffic: W7AYH 20, W7BRD 13, W7BRU 2, W7BKA 20, W7BAA 23, W7BYX 2, W7QD 10, W7AKZ 6, W7AJQ 40.

MONTANA — SCM, O. W. Viers, W7AAT — W7AOD is our star traffic station this time. W7BSS, W7BST, W7CBS and W9GXY were visitors at Missoula. W7CHW handled a few. W7CNE took a trip to Chicago. W7BZA is doing some nice work. W7BDJ keeps schedules with W7BYE, W7BZA and W7BNX. W7AHF turned in a nice total. W7CEG is on with '45s. W7BCE pops up with a surprising total. W7FL has moved to Bozeman for school. W7BNL is working in Bozeman. W7AFY plans to be on again soon. W7BNU has a new c.c. layout. W7BST had a fire and got burned out. W7BDP is trying to make 211Es perk. W7ASQ has been on a three weeks' vacation in Denver, visiting home folks and W9CAB, his father. W7CU will probably move to California soon. W7BGC raised his first VK. W7BHB has been busy golfing. W7BII and W7BYR are new ORS. W7BVE plans to change his MOPA to c.c. W7BQG has changed QRA in Great Falls. W7BYE reports the key click filter designed by the SCM and shown in the Experimenters' Section of July 1931 *QST* is very FB. W7BOZ visited W7BEI and W7BMO. W7BSU uses '16 in PP TNT. W7AYG has ordered parts for a new c.c. MOPA. W7BDJ did some operating at W7COE, the Great Falls Electric City Radio Club station, during the Fair and Hanfest there recently. W7AAT has about given up hopes of getting on with high power.

Traffic: W7AOD 113, W7AAT 24, W7FL 21, W7AHF 61, W7BGC 3, W7BDJ 12, W7BII 46, W7BVE 42, W7BQG 35, W7BYE 28, W7BSU 3, W7BCE 63, W7CHW 6, W7BZA 31.

OREGON — SCM, Ray Cummins, W7ABZ — W7AWH is high man for the month. W7CCU, American Legion Convention station in Portland, was manned by W7ALA, W7BYC, W7WJ, W7BTS, W7PK, W7HD, W7AEM, W7QY, W7BGW, and W7ABZ. W7ALA is back on the air. W7WL is going deer hunting. W7AZJ reports for the Coos Bay Club. W7AJX and W7AHJ attended the Yakima Convention. W7QY reports two new Portland stations, W7APF and W7AQY. W7BUF is Coos Bay Club's new Vice-President. W7ZZZ joined Army Net. W7BXQ says VE4's big DX for him. W7AOL visited SCM. W7ACH remains RM for Oregon. W7WR sends in a nice total. W7BWK says 3.5 mc. great for Alaska schedule. W7AGX and W7VT relayed American Legion traffic. W7APE sends in OBS schedules. W7AEM possesses a new pair of '66s. W7ABH is attending OSC this year. W7PF is QRL farm work. W7BOH works his first VK and ZL. W7PL reports via radio. W7ABZ is c.c. on 3596 and 3595. W7AJX has some fine schedules. W7SY is the only Eugene reporting station this month. W7ALO resumes activity on Army Net. W7CBA will be back in Astoria this year. W7AYV has four crystals. W7BOO and W7BZS send in traffic reports. W7AZB had to fight fire. W7BKL goes back to school. W7AMQ applies for ORS, and W7EN for OBS. Your new SCM wishes to thank all his friends for the best wishes received. I am looking forward to a very active year, and desire the cooperation of all the amateur operators in Oregon.

Traffic: W7AWH 410, W7ABZ 222, W7WR 135, W7AYV 118, W7BXQ 80, W7APE 84, W7AEM 73, W7BWK 61, W7CBA 49, W7BOO 48, W7ABZ 32, W7BKL 20, W7PL 19, W7ACH 18, W7SY 14, W7AHJ 13, W7ALA 11, W7BOH 11, W7AMQ 9, W7WL 4, W7QY 2, W7BZS 2, W7AZJ 1, W7ED 65.

ALASKA — SCM, Richard J. Fox, K7PQ — This report received via radio from K7FF by W7AXJ and mailed to HQs. K7TF reports reception cards from England and Germany for 14 mc. and from England on 7 mc. K7CNY and K7CKT are new hams. K7ASM keeps a 'phone schedule with K7BND. K7BFO is building a p.p. transmitter.

K7APH awaits a couple antenna poles. K7FF rebuilt his 75-watt outfit. K7ABQ and K7ASV are having great results on ultra high frequency. K7CNF has an FB 30-watt c.c. job. K7AZ has been working K7FF on 3.5 mc. K7BLI was only communication the town of Kennebott had while the bridges and telegraph lines were out. K7AOC and K7CF have gone to the States for the winter. K7BND has left for his trapping cabin. A wedding helped put K7PQ into the BPL.

Traffic: K7ARL 11, K7CEE 17, K7BHR 12, K7BMY 129, K7PQ 230, K7FF 234, K7BLI 111, K7CKK 60.

WASHINGTON — SCM, John P. Gruble, W7RT — W7BB is leader in traffic work. W7BOB secured special permission from Washington, D. C., to operate at the Puyallup Fair. W7WY has gone prospecting. W7AXT and W7RT ran neck and neck. W7BHP passed license requirements. W7KK has new QRA. W7AJ keeps schedule with W7IG. W7NE had trouble with burnt-out equipment. W7CGK is getting tired of working Sixth District. Hi. W7UO is building 1715-ke. 'phone. W7ATW may use pair '52s. DX on 14 mc. interests W7BKW. Most of W7BWS' traffic is relayed. W7AQB has five Weston meters. W7BYS uses five watts. W7UX is eager to contact Africa. W7BRW sends a fine report. W7WU has been maintaining Kent's reputation. W7AIB has been moving. W7BVA got well ahead of his rivals at W7CCF. Mrs. Anne Bell, popular Tacoma XYL, passed her amateur exam with a grade of 88! Fleet Week traffic aided the totals of W7APS, W7QI, W7TX and W7LD. W7BHL is the portable of W7LD. W7AVM uses relay system which turns on three power supplies simultaneously. We are pleased to hear from an old-timer, W7OJ. Ex-6AFY is new local at Rochester. W7AAX does the heavy work for Tacoma. W7IG is still laid up. W7BUW clicked VK3JE. W7BHH is still wondering what he and W7BZN did at Yakima Convention. W7TZ handled traffic. New QRA at W7AFC. W7BCV reports for W7BIX, W7BEX, W7AGP, and W7BDA. W7CND is planning to join Navy Net. W7BOC worked his first K7. W7AYO sends the dope on Yakima. New amateur at Naches is W7ALH. W7HS is principal eastern Washington relay station. W7ABU and W7CMO will deliver Tacoma traffic efficiently. Another 1.7-mc. 'phone enthusiast is W7CJS. W7BFG clicked with F8BS. W7BBB represented Bellingham at Yakima Convention. W7BUK contacted four districts recently. W7AFX dropped in at W7RT's. W7CKA, W7BUL, and W7BFL handle traffic for Bellingham. W7BIW does a nice bit of relaying. W7AZI relayed a message to his mother, who was enroute to Alaska, beating the boat. Between W7FJ on c.w. and W7IA, 'phone, Kirkland manages to retain its reputation on the air. W7AIT was off air temporarily. W7BGH got XU1U at Hong Kong. All amateurs interested in forming the N.P. traffic net, are urged to write immediately to Mr. Iversen, W7AW, at 6554-18th NE, Seattle. Listen for Official Broadcasts from W7AJI as follows: 3540 kc. Tuesdays, 8 p.m., and on 7080 kc. Saturdays, 7 p.m. P.S.T. W7BZB, 'phone, got R9 from K6BAZ. The National Guard Armory at Spokane has new station, W7CMH. W7AXR constructed receiver and transmitter in portable fashion for the State Forest Service. W7GR is leaving for Seattle. Thanks to W7AZE for first report. W7AHQ is lined up for ORS. W7KO is always glad to give any station a frequency check. W7KO is our Official Observer. W7AXT uses a PZ tube. W7APR had trouble with schedules. W7ASN is ex-7QE-7AQI. The SCM thinks W7AYO's sister has the markings of a fine YL op. We appreciate the nice letter from W7AXI-W7BUC. W7AG plans to have '04A going. W7DF, W7FP, W7CCF, W7HE, and others greatly aided in display and traffic work at Western Washington Fair, Puyallup, where portable W7ZZH was used. W7KW and W7BEY are working on c.c. rig. W7WG returned from Alaska. W7TS is busy with Forest Service. W7HE and W7BRS are cutting and grinding crystal oscillators. W7AAO contacts VK, ZL, XU, B4UP, etc. W7BCB, Seattle's YL, is heard on 7 mc.

Traffic: W7BB 703, W7BOF 398, W7WY 291, W7BIX 235, W7RT 185, W7AXT 182, W7QI 148, W7LD 124, W7AIT 124, W7BRW 122, W7IG 112, W7AAO 100, W7APS 99, W7HS 97, W7BEX 96, W7BCV 86, W7AYO 82, W7BIW 81, W7WU 72, W7TX 72, W7BBB 66, W7NE 56, W7BVA 55, W7AGP 51, W7FJ 46, W7AIB 40, W7OJ 51, W7SL 34, W7BUK 33, W7KK 29, W7BHH 27, W7AFX 25, W7UX

24, W7BUW 24, W7KO 26, W7BGH 22, W7BFG 22, W7BWS 21, W7AQB 21, W7AW 20, W7AJ 20, W7AAX 15, W7CKA 14, W7ABU 15, W7AXI 12, W7BDA 12, W7AFC 11, W7TZ 10, W7CCF 10, W7CMH 8, W7BOC 8, W7CMO 8, W7AAE 7, W7GR 6, W7BZB 6, W7ADS 5, W7BUL 5, W7UI 5, W7CJS 4, W7BRG 4, W7APR 3, W7AVM 3, W7AJI 2, W7ALH 2, W7BRP 2, W7AZI 2, W7AAN 2, W7BCS 2, W7BHP 2, W7CFZ 2, W7AZE 1, W7BHL 1, W7BFL 1.

PACIFIC DIVISION

NEVAADA — SCM, Keston L. Ramsey, W6EAD — W6AJP handled traffic from the V.F.W. Convention at Sacramento. W6AAX has a 50-watt c.c. rig. W6UO reports traffic. W6BYR is going in for high-power 'phone. W6EEF is rebuilding MOPA. W6FMS is building a dynamic microphone. W6FUO has added an amplifier to his rig. W6AFR, ex-W9HQ5, worked some FB DX. W6ESC is on with a flea power rig. W6FIE is also on. W6EAD has remote control now. W6CRF and W6BTJ have gone gold prospecting.

Traffic: W6AJP 203, W6AAX 24, W6UO 16, W6FUO 15, W6AFR 7, W6BYR 1.

ARIZONA — SCM, Ernest Mendoza, W6BJF — W6CDU resumed KAIHR-WLM schedule. W6BRI handled messages from the N.G. station W6CLE. W6BLB worked hazy KFHW. W6CEC is on every day. W6DHR is new ham in Douglas. W6CVV reports South Americans coming in on 7 mc. W6COI may attend Coyne Electrical-Radio School. W6FAI, W6CAP, W6AGL, W6FOH, W6BLP, W6GS, W6CVR and W6FZQ attended the Pacific Division Convention. W6FZQ and W6BJF did some "trading." W6FIP is chief op of WUQ. W6GDD heads the "Radio Service Laboratory." Phoenix. W6CQF returned from vacation. W6CLL is having nice luck with c.c. rig. W6BYD has new frequency meter. W6AEK modulates a '10 with an '11 "D." W6EKU is rebuilding receiver. W6FKX is swapping things right and left. W6GJC is working a gold claim. W6ZZBC (W5ZZB) is in Williams. W6DKF has electron-coupled frequency meter. W9GDH of Kansas City, Kans., visited W6BJF and W6CDU. W6CKF is old W6CWI. W6EFC is in Los Angeles Radio School. Ex-W6DXC moved to Pomona, Calif. W6CEW is Corporal in Radio Section, N.G. W6FLG is issued to Frederick L. Green. W6FGO wants to modulate his heap for 'phone. W6DJH is to be chief technician of Phoenix' new police radio station. W6BCD, W6DIE and W6GZ may be the other ops. W6AND gets on the air occasionally. W6FEA is constructing a 200-watt c.c. rig, with the aid of W6CKF. W6BVN will soon have her own "peewee" c.w. outfit going. W6EBP is experimenting with 56 mc. W6FIL has not returned from the coast. W6UG is working on 7 mc.

Traffic: W6CDU 370, W6BRI 49, W6CEC 39, W6BLP 30, W6DHR 27, W6CVV 17, W6COI 14, W6CAP 13, W6FZQ 5, W6FIP 2, W6CQF 1.

East Bay — SCM, S. C. Houston, W6ZM — CRM J. H. MacLafferty, Jr., W6RJ. Alameda County: W6CDA leads the Section this month. He now signs WLV3 in A.A.R.S. W6GMX held schedules with W7CCU at the American Legion Convention in Portland, Oregon. W6AF has a new c.c. rig. W6ZM was busy making arrangements for the traffic booth at the California Flower Festival. W6CTX handled quite a few. W6RJ handled one message resulting in medicine being sent by plane and the recovery of the patient. W6CIQ took a few from the Legion Convention. W6CSV is keeping Albany on the map. W6EGZ blew an '81. W6DUB is going to put in 50-watters. W6DKJ is helping keep Albany on the map. W6CIS is working on c.c. rig. W6NAC makes the BPL both ways. W6ANF, W6AOM and W6AMJ also report. Contra Costa County: W6EJA sends in a good report. W6AAT is NOT a YL in spite of his name (look it up). W6FQE says there is quite a number of hams on 1.75-mc. 'phone these days, among which are W6EJA, W6BIG, W6BIS, W6EUQ, W6BOO, W6CYL, W6GIU, W6AON, W6EHQ, W6CX and W6ZAW. I am very sorry to have to announce the resignation of W6ATJ as Chief Route Manager for the Section. He will be succeeded by J. H. MacLafferty, Jr., W6RJ. With the next report, the first six months' traffic contest will be brought to a close and the winner will be presented with the Hammond Memorial

Bug, to have and to hold until April 15, 1933, at which time it will go to the winner of that six months and so on. Each winner will have his call engraved on a plate on the bug. It is a trophy worth working for, having been presented to the Section by Mrs. W. A. Hammond, widow of the late W. A. Hammond, W6ALX.

Traffic: W6CDA 654, W6GMX 563, W6AF 324, W6ZM 283, W6CTX 215, W6RJ 202, W6CSV 50, W6EJA 48, W6EGZ 40, W6CIQ 63, W6DUB 24, W6ATJ 23, W6EJ 13, W6CIS 5, W6AAT 1, W6FQE 15, W6NAC 634, W6AN 139, W6AOM 68, W6AMJ 29.

SAN JOAQUIN VALLEY — SCM, E. J. Beall, W6BVT — W6FBQ promises to be a regular reporter. W6SF handled some county fair traffic. W6BIL says the Tulare gang had a rip-snorting time at the Convention. W6ASV now has seventeen countries to his credit. W6BJC holds down the U.S.N.R. around Tuleare. W6CJL is mousing around with 1.75-me. 'phone. W6AOA reports for the Bakersfield gang. W6GEG applied for ORS and OO. W6FJL's OW ran him out to the garage. W6DQV is the Key U.S.N.R. control station for Unit No. 5. W6ENH uses three '45s in parallel. W6AOB changed locations. W6FKV is active again. W6EXO is trying out the new a.c. superamp. W6AOA is gunning for a 211D. W6BKT is with State Highway Commission. W6FRH worked W9FRH. W6GFB is new ham in Turlock. W6FFU built his outfit. W6BIE is the 'phone man of the Section. W6AME maintains schedules with U.S.N.R. stations. W6EPQ worked CR740. W6BXB has one of the new three-year tickets. W6CVA is working K6's and K7's. W6GJO and W6AKR are rebuilding to c.c. W6EZT is on 7 mc. W6BBC popped his fourth crystal. W6DZN is vacationing in the tall timbers. W6DV1 worked his first "J." W6EXH is working on crystal control. W6WBW is now being a good boy at school. W6DXL and W6BTB are just married. W6AOZ and W6BFH are sobering up from the Long Beach Convention.

Traffic: W6BKR 3, W6FRH 8, W6AGV 18, W6DQY 11, W6FFU 50, W6BIE 21, W6AME 10, W6BUZ 4, W6EPQ 24, W6BIP 14, W6AOA 339, W6GEG 150, W6ASV 25, W6EUQ 18, W6BIL 8, W6SF 106, W6FBQ 13, W6BVY 93, W6CVA 42, W6GJO 6, W6BFH 27, W6EXH 8, W6BBC 42, W6AOZ 54, W6DZN 120, W6DV1 101, W6ZZB 15, W6AKR 42, W6WJ 425.

SANTA CLARA VALLEY — SCM, Bruce Stom W6AMM — The 14th Annual Pacific Division Convention is to be held in San Jose at the Saint Clare Hotel. The S.C.C.A.R.A. would surely appreciate hearing your suggestions. W6AMM's total grew out of only two weeks and three days of operation; all trans-pacific. W6HM again turned in a nice trans-pacific total. W6DSZ is clearing traffic for Cocos Island expedition. W6ACV has the nicest crystal 50-watter that you could hope to see. W6QR is carrying four daily schedules. W6BRW filled in for stations while their operators were at the Convention. W6FOO-W6FBW changed QRA, handled 18 messages, went to the Convention, and turned in a fine RM report. W6ENF-EAI reports W6CEO resumed KAIRO schedule. W6DBB was QRL prune harvest work. W6DSE, W6DBB and W6QR are new ORS. W6FIK moved to new QRA. W6FPL worked a "J" with an '01A. W6GGL gets out FB. W6DBQ reports for Watsonville gang. W6GFH is semi-active.

Traffic: W6AMM 412, W6HM 221, W6DSZ 127, W6ACV 113, W6QRL 199, W6BRW 32, W6FOO 18, W6ENF 12, W6CEO 9, W6BDR 6, W6DBB 5, W6CDX 5, W6FNP 5, W6DSE 4, W6DHV 2, W6DBQ 22.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — Acting SCM, Byron Goodman, W6CAL. W6PQ breaks into the BPL. W6NK also makes the BPL. W6EKC has a nice total. W6BMK reports for the first time. W6FPW, W6PW, W6CWJ and W6DW are planning 56-me. rigs. The 56-me band has been kept busy by W6AKU, W6SG, W6CAL, W6EYY and W6AVC. W6DZZ is trying to find time to change over to MOPA. W6WU-W6CZK is now WAC. W6BVL is bothered by his power leak. W6ERS is looking for Europe and WAC. W6BNA changed QTH. W6WC has his new c.c. '10 going OK. W6ABB and W6BII report their traffic. W6WB came back from the Convention with an '04A and a 2500 v 2 mfd. condenser!

Traffic: W6PQ 1012, W6NK 655, W6EKC 210, W6BMK 52, W6EPU 50, W6PW 38, W6WU 29, W6CAL 29, W6DZ

23, W6B 5, W6W 5, PHILIP KAIXA, KAIINF, vacation few weeks. Traffic 112, KA KAIUP 2 SAN D returned are getting W6APC ready for harvesting W6ACJ condenser W6AYK 1.75-me. Utah. We the air. awaiting carry off Convention structure.

Traffic: W6AAN 1 W6ACI 1 LOS ANGELES — The air is the historic month! A W6ETJ is for unemploy is knocking W6BPK is net. The W6AOA has new ZSA, W6 private co. unemployed new antenna W6EKG W6EGH making V 18th! W7Z is going to is an old convention. C pet parrot W6ENR fine received can Army Ne structing banner by in the Arm schedules. W6EZT. was heard back on a W6BLS e stalled 75-watt DEMO1919. W6CCF water-cooled volt tank and SCW W6FKF going to 1 convention fr W6FMH W6AN menting w at recent given cred

23, W6BVL 22, W6EYY 22, W6BII 13, W6ERS 5, W6WC 5, W6WB 4, W6ABB 1.

PHILIPPINES — Acting SCM, Newton E. Thompson, KA1XA — P.I. hams very active, with three new hams, KA1NE, KA1PS, KA9WX. KA1NA is on three weeks' vacation in China. OM E. C. Cook, G6UO, is in Manila for few weeks.

Traffic: KA1HR 940, KA1NA 212, KA1LG 188, KA1CO 112, KA1TS 73, KA1JR 46, KA1XA 39, KA1CM 37, KA1UP 32, KA9WX 21, KA1PB 14.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6UA returned to college; will use W6EFW. W6FWJ and W6EPW are getting ready for traffic. W6BHV reports W6AXN and W6APG are getting ready for winter. W6CTP is getting ready for the contest. W6BAM and W6BVX are busy harvesting walnuts. W6BWQ is new station in Santa Ana. W6ACJ has a new P.P. transmitter. W6BCF is blowing condensers. W6BAS is preparing to go back on the air. W6AYK is building a new MOPA. W6CTR is building a 1.75-mc. 'phone. W6CNQ spent the last few months in Utah. W6BKZ is putting up a new pole. W6EZQ is back on the air. W6QY has moved to new location. W6FQU is awaiting change of address. W6EOP was the lucky one to carry off the main door prize, a Comet Pro. receiver at the Convention. W6DNW has a new transmitter under construction. W6QA reports a nice vacation.

Traffic: W6UA 40, W6FWJ 35, W6BKZ 19, W6BHV 16, W6AXN 7, W6EPW 4, W6EOP 4, W6CTP 3, W6BAM 2, W6ACJ 1.

LOS ANGELES — SCM, H. E. Nahmens, W6HT — The air is still ringing with "convention"; the greatest in the history of the Pacific Division! 163 traffic reports this month! A gain of 18 over last month. Los Angeles County: W6ETJ is back in the lead. W6AKD is doing excellent work for unemployment relief warehouse in Compton. W6AOR is knocking 'em cold. The traffic contest sponsored by RM W6BPU surely produced results. W6EBK has fine total. W6PP is the control station for the unemployment relief net. The call of the control has since been changed to W6AFO. W6EDW threatens to QSY to 1.75 mc. W6ETL has new Hammerlund "pro." W6CVZ worked ZS2A. W6FGT says school holds him down. W6DWY won private contest between himself and W6DQZ. W6CZZ is unemployment relief station for Long Beach. W6CXW has new antenna 75 feet high between poles 200 feet apart. W6EKZ is back from Alaska. W6DQZ blew his filter. W6EGH brought world's record to the Sixth District by making WAC in three hours and seven minutes on Sept. 18th! W7AIE is operating W7ZZK in Atascadero. W6COF is going to run his '52 at 600 watts input. W6DBC, ex6BFC, is an old-timer. W6AFU won the sending contest at Convention. Convention? Ask W6FEX. W6TE worked W4OC's pet parrot on 14-mc. phone. W6EUV returned to USC. W6EK finds it easy to QSO East Bay hams. W6AAN gave a fine report on the A.A.R.S. at Convention. W6CEM received card from ZL in midsummer. W6EII is member of Army Net. W6AHQ has worked 73 V.K.s. W6CVF is constructing new transmitter. W6DKM helps Section win banner by inducing other hams to report. W6BYF is located in the Armory at Long Beach. W6FRB wants some traffic schedules on 7 mc. W6EVE's call has been changed to W6EZF. W6RE is now signing W9MY in Illinois. W6CUH was heard QSA5 R8 in England during eclipse! W6DVA is back on air signing W6NW. W6BGF is on delivery net. W6BL8 expects to handle plenty traffic. W6CGP has installed 75-watt final. '52 at W6ACL running cold with 500 watt input. W6WO received 7-mc. heard card from DEMO195 in Germany. W6DES is a new ham in Pomona. W6CCF changed QTH. W6AM installed a new W6RW water-cooled tube. W6AUX has trouble keeping a 12,000-volt tank condenser from arcing over. W6DIO, ex-W2EV and SCM, makes first report. W6GKF passed her exam. W6PKF took message from TGIA for L.A. W6EYJ is going to 1.75 mc. W6DSP reports ten hams attended Convention from Glendale Radio Club. W6BMN is on 56 mc. W6FMH was QSO XU1U. W6DFB is second op at W6HT. W6ANN is servicing BCL rigs. W6BSW-BOB is experimenting with 56-mc. phone. W6ON reports 111 attendance at recent Pasadena Short Wave Club meeting. W6ANH is given credit for report received from Compton sans call or

name. W6UU hopes we make our goal of 200 traffic reporters. W6EOG had great time at Convention. Sorry FZ; no dope; no write-up. Ex9DXG is signing W6FUF now. W6BVC has new '61. W6BCK and W6DZK have gone into radio business together. W6FJT reports for W6HX. W6ZZA finds the Win. Taylor Hotel in Frisco a much better location than the Stewart. W6EXQ worked CR7AD. W6DH blew his only '52. W6FDE has installed '60. W6FMP has new 211. W6EMJ acquired new SW3. W6CEU craves a shingle single shaper het. W6BEE is trying to QSO Los Angeles on 56 mc. W6ESA is getting better results. W6FXR sends in reports for W6FUF, W6DOK and W6GHX. W6DLN was awarded the Leach relay won by the SBAA for best stunt at Convention. W6CTT has changed his code lessons to Thursday only at 7:30 p.m. W6BXE sat up all night to be first to register at Convention. W7BCH is now W6FMI. W6FEW is QRL Pasadena J. C. W6BER is back from vacation. W6TH is new call of W6AIZ. W6BXH is op at W6ALD. W6AGM has FB new shack. W6FPV would QSY to 28 mc. if there were anyone there to QSO. W6BHT is signing W9DNL in Newport, Ky. Although W6VO had his call on back of car, he didn't encounter a single ham on his trip through the Ninth District. W6ERL moved. W6FTV is QRL school. W6HG is working at KELW 4-6 a.m. W6DRZ is on 1.75-mc. 'phone. W6DPB is experimenting with television. New reporters are: W6DTN, W6PP, W7ZZK, W6ZZG, W6DBC, W6EVL, W6NW, W6AUX, W6DIO, W6FGS, W6BGJ, W6AAE, W6FUF, W6GHX, W6GBK, W6FMI, W6DZK, W6FPV, W6FMH, W6TH, W6BGN, W6EII, W6EZF, W6FMK, W6CFI, W6GEU, W6FLC, W6GOJ, W6BXE, W6EYV, W6FSJ, W6FMO, W6ECC, W6FVV, W6AMQ, W6DTX, W6AQD, W6CWZ and W6FWN. Santa Barbara County: W6EZK leads the entire Section and wins crystal offered by W6BPU in his delivery net contest. Portable W6GDU, operated by George Grening, exW6YAU, made the BPL on delivery of Boat regatta traffic. W6BZF, owner of W6GDU, also did excellent work during the regatta. Excellent report from W6AWY. Chief op of W6FNK attended Legion Convention in Portland. W6FYF moved to Long Beach. W6FFF is getting R9 reports from foreigners. W6DJZ is on with new 50-watt c.c. rig. W6EDZ has resumed schedules. W6EMY says for the guy who is using his portable call W6BYG on 1.75-mc. 'phone to please QRT! A broken foot couldn't keep W6ZBJ home from the Convention. W6DBJ is stepping out. W6EWC installed new dome tubes in receiver. W6BZF, W6GBK, W6GIE and W6ENJ have been operating government portables for the Forestry Department in the big Ojai forest fire. New reporters are: W6GDU, W6GKB and W6ASK. San Bernardino County: W6CUJ leads the county. W6BMC has returned to New Mexico. W6FYT is planning to install pair of '04As. W6CVV expects nice total next month. W6FEC has erected 7-mc. zepp. Reports received from W6BIK, W6FNG, and W6DZC. Riverside County: W6TJ leads the county. The power supply at W6DLV went west. W6EYF was on vacation. San Luis Obispo County: W6DWW's job keeps him out of town. W6ALQ is taking all years in one in Electrical Engineering course at Polytechnic. Mono and Inyo Counties: W6FVD is on the delivery net. W6CYU is new ham in Lone Pine. W6CYU is new ham in Bishop. The next quarterly banquet will be held at the Masonic Temple in Pasadena, Saturday, December 3, 1932. The P. S. W. C. is sponsoring it and are planning on a whole-day affair. Drop a card to W6ON for details. New reporters: W6FVU, W6FTU, W6GNQ.

Traffic: W6EZK 536, W6ETJ 398, W6AKD 296, W6BPU 258, W6EBK 230, W6PP 218, W6BZF 176, W6EDW 175, W6GDU 170, W6AWY 168, W6ETL 157, W6CVZ 156, W6FGT 128, W6DWP 124, W6DTN 193, W6CUJ 122, W6CZZ 101, W6BMC 98, W6CXW 94, W6EKZ 88, W6ALD 86, W6AOR 80, W6FNK 78, W6ETM 78, W6DQZ 75, W6BVD 73, W6FYT 71, W6EGH 71, W6CZT 64, W6EGJ 63, W7ZZK 63, W6COF 62, W6FMK 60, W6DBC 49, W6AFU 46, W6FEX 45, W6TE 45, W6AKW 44, W6CTD 43, W6EUV 43, W6EK 41, W6FNG 40, W6FFF 39, W6DVV 38, W6AAN 37, W6ZZG 36, W6EVL 36, W6CEM 32, W6DZC 31, W6EII 31, W6AHQ 29, W6TJ 28, W6DZR 27, W6BGN 26, W6CVF 25, W6HX 25, W6DKM 24, W6ELX 24, W6BYF 23, W6FRB 23, W6EZB-W6BVZ 22, W6CUU 21, W6AQD-W6CUH-W6NW 20, W6BCT-

W6GOJ 19, W6EHZ 18, W6BGF 17, W6BLS-W6CVV-W6CGP 16, W6FOW-W6ACL 15, W6AQ-P-W6WO-W6CCF-W6AM-W6AUX-W6DJC 14, W6BIK-W6DIO 12, W6FVD-W6FKF-W6BFL-W6TN 11, W6EYJ-W6DJS-W6DSP-W6FGS 10, W6FMH-W6BME-W6FVV-W6H7 9, W6ANN-W6BOB-W6FEC-W6ON 8, W6ANH-W6FWN-W6DBJ-W6BGJ-W6UU-W6EOG 7, W6AAE-W6DLI-W6EDZ-W6CNH-W6FZ-W6FLC-W6FUF-W6BVC 6, W6ECC-W6FSJ-W6EYD-W6BCK-W6FJT 5, W6ZZA-W6EXQ-W6DFB-W6GEU-W6DH-W6AMQ-W6FDE-W6GHX 4, W6FMP-W6EMJ-W6LC-W6CEU-W6BEE-W6ESA-W6MA-W6FXR 3, W6GBK-W6DNL-W6CFI-W6CTT-W6AIX-W6FMI-W6DLV-W6CNO-W6GKB-W6FMO-W6BXE-W6FEW-W6BER-W6FYA-W6DZK-W6FJS 2, W6TH-W6ASK-W6EMY-W6BXH-W6CWZ-W6DTX-W6FAV-W6GJA-W6BHP-W6AGF 1, W6FVU 10, W6FTU 10, W6GNQ 5.

ROANOKE DIVISION

WEST VIRGINIA — SCM, C. S. Hoffmann, Jr., W8HD-W8NS — The Ohio Valley Amateur Radio Club operated WSFJS at the W. Va. State Fair. W8GB turned in the largest traffic total on record for W. Va. — 1,062 messages! W. Va. has been divided into two districts, the Northern and Southern. The divisions of the districts cover the same counties as the Northern and Southern districts of the U. S. District Courts of W. Va. W8GB is the newly appointed RM for the Northern, and W8OK RM for the Southern. W8HD is working on 7 and 3.5 mc. W8DPO QSO'd OK2MA. W8BKG passed unlimited 'phone exam. W8CWY worked his first VE5. U.S.N.R. Unit in Wheeling have license W8DOB. W8HCL is new Wheeling ham. W8CSF is rebuilding. W8BOW is installing crystal. W8FQA. W8TI, W8FQB and W8BTB are going to college. W8IB has schedule with Y16KR in Iraq. W8GAL is using c.c. W8HHP and W8FNS are going strong. W8GBF is using 250 watts. W8CVX applied for ORS. W8ASI represents Buchanan. W8CLQ, W8GEG and W8AIC are constructing remote controlled sets. W8SHSA worked 132 stations first month on air. Boundy of W8ZW, W8CDV, W8TI and W8AKZ report getting new Extra First licenses. W8GRU is putting up 9-foot mast! The SCM was glad to hear from Virgil Henthorn of Padon City, a promising ham. W8CAY is on trip to Ohio. W8OK, W8AGO, W8DNX and W8GTD visited W8HD.

Traffic: W8GB 1062, W8FJS 347, W8BOW 286, W8HD 245, W8GBF 118, W8CVX 113, W8DPO 82, W8FBQ 53, W8GEG 50, W8BWK 35, W8EIK 46, W8CWY 28, W8HSA 26, W8CSF 17, W8CLQ 14, W8HCL 14, W8AKZ 12, W8ELO 11, W8HEI 11, W8BHG 6, W8GRU 5, W8BKG 3, W8CDV 2, W8FZH 2, W8OK 1.

NORTH CAROLINA — SCM, H. L. Caviness, W4DW — RM, G. H. Wright, W4AVT. Listen on 3.5 mc. on Monday nights to the following A.A.R.S. stations working their fifteen-minute schedules: W4JR, W4EG, W4CC, W4JB, W4VJ, W4HM, W4TS, W4LY, W4AVT, W4ZH, W4CS, W4AEH, W4AYA, W4ANU, and W4DW. W4AVT has a new p.p. amplifier. W4JR is on 3852 kc. W4AAE reports. W4ADK is doing good work. A VO was W4VB's best DX. W4RJ says there is no traffic on 7 mc. W4AGF has been rebuilding. W4BHR and W4RE have been on vacations. W4AEH is heard on 3.5 mc. W4GZ has returned to State College and is at the key of W4ATC on 7202 kc. W4IF and W4BOH are also operators at W4ATC. W4TR was on 'phone. W4PW worked all U. S. districts in one day with his 3.5-mc. 'phone. W4ABW is moving. W4PEY is teaching at Lakeland, Fla. W4VJ keeps his schedules in the AA drills. W4BCG moved into his new shack. W4BBS had two weeks active duty training at NAO. W4TN is selling out. W4BLU and W4BLV are going well on 7 mc. W4AMC is on 3.5 mc. W4CP may be heard around 7100 kc. W4JB and W4QS attended the hamfest in Winston-Salem. WPTF donated booth space at the State Fair ground for the use of the amateurs of Raleigh during the State Fair, October 10th-15th. They will operate under the call W4PEG on 7 mc. W4EG has completed his 50-watt c.c. rig. Greensboro: W4ZH is on 3585 kc. W4ATS recently worked Egypt on 14 mc. W4AOE is back on the air. W4MR continues to work good DX. W4ACA is now a student in Davidson College. Asheville: W4TO has a '52 in the last stage. W4ANI and W4ANE are inactive. W4ACW sold out. W4BC and W4HJ

are at school. W4ABN, W4AXZ, W4QA, W4WL, and W4GW are working 'phone. W4GW has a new baby to call CQ for him. W4QA uses 1.7-mc. 'phone. W4ABN is building a new superhet. W4AXZ and W4WL work quite a few W6's. W4AL, W4AZP, W4TH, W4HX, and W4LY are c.c. enthusiasts. W4AWZ is giving the DX hams a thrill. W4QJ has just added an '04A amplifier. W4ANN is fighting QRM. W4AUE has a '10 working like an '04A. W4BOQ, W4BK, and W4BJY are doing good work on 7 mc. W4EJ is adding a 50-watter. W4MI is pounding brass at W4LY's and W4BJY's. Winston-Salem: The gang dedicated their new clubhouse on Sept. 17th with a big hamfest. W4ABT is QRL a YL. W4AHF is rebuilding. W4IY is on regularly. W4RA has pentodes amply exciting his '10 p.a. W4PA plans to install a crystal. W4OG is rearing to QSP.

Traffic: W4ZH 127, W4JR 77, W4GZ 52, W4DW 49, W4ACA 39, W4AVT 26, W4BCG 17, W4AMC 16, W4TO 16, W4VB 11, W4EG 9, W4ATS 8, W4AEH 7, W4AOE 6, W4ANU 4, W4RX 3, W4ABN 2, W4JB 2, W4ADK 1.

VIRGINIA — SCM, R. N. Eubank, W3AAJ — W3NT is using W3NB now. W3BJX is in old traffic stride. W3FJ is on 3.9-mc. 'phone. W3CLH is old-timer. W3BNX flew to NNINIC. W3AKN handled death message. W3CXM took 2200-mile trip. W3ACN gave two-hour delivery from Haiti to Charlottesville in storm. W3BUR is Secretary of Roanoke Club. W4CE is with us at Roanoke. W3CMJ visited Petersburg Club. W3NE is on 7 mc. W3CEY has old call W3TN back. W3APT is back on 3.5 mc. W3APU is getting out. W3COO reports traffic. W3BSB works early A.M.s. W3AVL-W3AVY is on 'phone and c.w. W3AZU is forming club. W3BZE reports traffic regularly. W3FE says 47 works FB. W3CAK is rebuilding. W3AHQ changed address. W3BXP has new Zepplin and receiver. W3CAH reports everything lining up. W3WM changed location. W3CPN is using 100 watts. W3AJA has regular schedules. W3BWA's QRA is 400 W. 30th St., Norfolk. W3BA is experimenting on 56 mc. W3AAF is new station at Bluefield. W3BAN is still "world's" best Official Observer. W3BRY has swell c.c. rig. W3AVR is QRL school. W3BIX is at U. of Va. W3BTC is big-time magician. W3AUG is QRL U.S.N.R. W3CFL is doing FB job with Richmond Club. W3GY has one grand 'phone rig. W3CA has swell rig. W3BEK-W3BFT is working 56- and 14-mc. duplex. W3II was on vacation. W3AWY will be on soon. W3CBE is on ship. W3BZ is resigning as Director Jan. 1st. W3AQK is building. W3AAR has bug after him now. W3ANV leaves us. W3BGS is awaiting license renewal. W3BAD is applying for ORS. W3ZZAU is portable of 3BAI. W3AAE is working on 56 mc. W3ABM, W3COJ and W3CNY are new stations in Roanoke. W3BF1 and W3BIW are new stations in Danville. W3CQD is W3BIX portable. W3QX is Secretary of Charlottesville Club. W3BAD was heard in N.Z. on 3.5 mc. W3BJE is now in Portsmouth. W3AIE and OT Peake are planning big things. W8EIK visits in Va. often. Miss W3QN visited L. Field stations. W3ZZB is portable of W3BFQ. Virginia Sunday QSO Parties have been resumed. W3GE is looking for schedules. Virginia claims two of world's tallest hams: W3BNH 6 ft. 7 in.; W3BWS 6 ft. 6 in. W3CHE has 10 p.p. W3CIE is at V.M.I. and will op at W3AII. W3AJK is new station in Norfolk. W3AGF sold out to W3BEK and W3BFT. W3ADD is building new receiver. W3AQK is returning to school. W3ARD is trying for ship. W3BEK has new KK Mike. W3BRA is on 56 mc. W3BRK is for sale. W3BRQ is QRL. W3HL moved to Balto. W3MQ, R. I., is working on new Super. W3BFT, W3BEK and W3BRA are planning 56-mc. tests. W3AJK is at R.M. College, Ashland. W3AAJ is on 3525 and 3649 kc. now.

Traffic: W3EI 279, W3NT 140, W3BJX 109, W3FJ 87, W3CLH 64, W3BXN 61, W3AKN 45, W3CXM 32, W3ACN 30, W3BUR 27, W3CMJ 23, W3NE 22, W3TN 20, W3APT 13, W3APU 8, W3COO 7, W3BSB 6, W3AVL 6, W3AZU 6, W3BZE 6, W3FE 6, W3CAK 6, W3AHQ 5, W3BXP 5, W3CAH 4, W3WM 4, W3AJA 3, W3BWA 3, W3BAI 3, W3AAF 5, W3BAN 2, W3BRY 2, W3CCK 4, W3CLD 8, W3BYA 5, W3AEI 10, W3ZA 3, W3GE 8.

ROCKY MOUNTAIN DIVISION

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — W6EXL and W6AHD of Cedar City kept that city in-

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formed of the condition of Dr. Madfarlane of Cedar, who was seriously ill in a Salt Lake City hospital. W6EYS has a portable call. W6ZZBN. W6DAM is going into traffic in a big way. W6BSE has a monitor. W6FEB changed to 50-watt amplifier. W6AVW is going c.c. W6EWW is rebuilding. W6CRS delivered a paper before the A.I.E.E. Convention at Vancouver, B. C. W6BAE-ZZAF was in daily contact with his YL, W6GCJ, in S.L.C. during a Pacific Coast trip. W6DGR was the representative of Utah at Pacific Division Convention. The U.A.R.C. staged a treasure hunt. W6DWH and gang won grand prize. W6BTX is commanding officer of Unit 1, Sec. 7, U.S.N.R. W6FRN has 400 volts on his '45a. A.A.R.S. work keeps W6DPJ busy. W6AFN is a past master at building Grammer's 3-tube portable receiver, say W6DGR, W6BAE and W6DWH. W6FAE has an MOPA. YL QRM does not help W6DTB's ham activities. W6APM wants a good Colorado schedule. Nothing new at W6DPO. W7ADF says too much depression. W7NY thinks silence is golden. DX hunting on 3.5 mc. interests W7AMU. W7ACG and W7CJR prefer 7 mc. W7BXS has a new receiver. W7CBL was last seen heading east on a hand car. Hi!

Traffic: W6DPJ 366, W6EXL 120, W6BSE 51, W6APM 29, W6EYS 25, W6AHD 25, W6DAM 25, W6DPO 24, W7CJR 21, W6FAE 16, W7ACG 6, W6AVW 4, W6FRN 4, W6DTB 2, W7BXS 2, W7AMU 2.

COLORADO — Acting SCM, Artie D. Davis, W9BJN — W9ESA and W9EAM went on fishing and rest trip. Our Director, W9AAB, is going to run for the same job again. W9BTO and W9DNP are in the race for the SCM job. The Convention held Sept. 8th went over big. W9CKO reports for Loveland. W9IFD is working DX. L. J. Bissey is a new ham awaiting a call. W9JFD is going to get new receiver. W9JFD is an electrician. W9CKO has a transmitter on both 7 and 14 mc. W9JAG was a visitor in Loveland. W9YR is back on 7 mc. W9GCM is going to lose his temporary license. W9EHZ has moved to Calif. W9RX owns KFXJ and X9DQG. W9EHC reports for Colo. Springs. W9DYP has a c.c. rig. W9HDI-W9EHC will soon have c.c. W9JCQ improved his note. The Pikes Peak Amateur Radio Association had a big meeting. They have started a code class for non-operators. W9JCQ handled a 210-word death message. W9INV tops the list in traffic. W9GNK is on 3.9-mc. 'phone. W9CDE was up to the Convention. W9CJJ needs only one more for a WAC on 'phone. W9BYY is using c.c. on 7 mc. W9FYI is QRL school. W9ARI is putting in c.c. W9DOC moved to Calif. W9AQN put a '52 in final. W9GUW is back in Denver. W9FPR is on 3.9-mc. 'phone. W9ESX is out of work. W9CVE is operating KFEL. W9AUJ will be on soon. W9CND is pushing a pair of '52s. W9FCK-W9HPY, gold mining, have a portable, W9KFJ. W9EPC is working 3.5 mc. W9EKQ is keeping Army Amateur schedules. W9APR is testing antennas. W9BYC is selling part of outfit. W9BXQ is chief op Police Radio. W9BYK is on with low power. W9CBU is on part time. W9CNL is QRL work. W9COC same. W9CSR is going to college. W9KIN is on with 250-watt. W9CWX has some power. W9CYM does some Navy Net work. W9DSB-ex9AJQ-W9HQT — Bill Groves-Melvin Collier — are keeping KLZ perking. W9HJS is on some from W9APR. W9FUQ builds a real short wave tuner. W9QL is working KOQ. W9QZ is QRL KFXF. W9JB started up a radio store. W9IAV is kicking out fine. W9HOO is sure making some good hams. W9GBQ is QRL Grange Lodge. W9HFZ is rebuilding to c.c. W9FUH is back to school in Pa. W9ECY is QRL radio service work. Same W9RJ. W9BVQ is busy with music. W9BOJ sold out. W9BNK-W9ASD is on some. W9GDH of Kansas City, Mo., and W9EFC of St. Louis visited Denver. W2KG, ex9ENM, has been second op at W9BJN. W9FYK visited the Denver gang. W9JGF has portable W9ZZAR. The North Denver High School set is being rebuilt by W9HGL, W9EBR, W9FFH and W9FYI. W9JGF is after DX. W9ACV is new ham. W9HOU is on occasionally. W9EYN and W9EOQ are building 1.75-mc. 'phones. W9JNV reported OK. W9ZAAJ and W9DNP assisted KVOR in the broadcast of the Pike's Peak races on Labor Day.

Traffic: W9JNV 259, W9CVE 182, W9GNK 23, W9JCQ 3, W9EHC 4, W9VL 16, W9KV 12, W9BJN 16, W9JGF 17, W9FYI 31.

SOUTHEASTERN DIVISION

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, Chas. W. Davis, W4PM — W4UT knocks 'em for a loop with the biggest total since W4PM has been SCM. CM2WW is now 0.0. He and CM2SH were elected to membership in Atlanta Radio Club at Sept. meeting. W4MO visited Washington recently. W4AXU is now attending G.M.A. in College Park. W4IN (15) is youngest member of the Atlanta gang. W4BEY is the star performer on 'phone. CM2JM's shack was searched by the police for revolutionary prop! W4BAG rates ORS. W4MA and W4BW report. W4AZT is now operating BC station in Augusta. W4WZ sends in nice report. Any good stations who want to join the Trunk Lines please contact our RMs — W4BO and W4AAJ.

Traffic: W4UT 419, W4BEY 96, W4BAG 28, W4WZ 67, W4BLQ 16, W4BJX 70, W4PM 10, W4SM 95.

WESTERN FLORIDA — SCM, Eddie Collins, W4MS-W4ZZP — Route Manager, S. M. Douglas, Jr., W4ACB-W4PCN. Everyone had a very FB time at the Hamfest in Tallahassee. W4ASW-W4ZZW won the hars contest. W4AUW has a brand-new three-year operator's license. W4BKD has P-P TPTG. W4BOW won a TNT transmitter at the Hamfest. W4BPG has moved to Georgia. W4BPI wants to get in the West Fla. traffic route. W4AFT has been pounding them out. W4ML sold one of his '03As to W4AGS-W4PCK. W4AUU comes across with a nice traffic total. W4SC was visited by most of the West Fla. hams this month. W4QR-W4PEL is on a trip to Indiana. W4ASG has a new crystal. W4AUV made trip to Atlanta and returned with a new operator's license. W4QK went to New Orleans for his. W4BMJ gets 500 volts out of spark coils. W4BLW is attempting the same and W4BIV wants the dope. W4BJF keeps a schedule with W4BNE. W4AXP keeps four daily schedules. W4ABK sports a FB P-P TNT rig. W4AQI promises big things. W4AQY-W4PDG is active on 3.5 mc. and 7 mc. W4AGS-W4PCK operates on three bands. W4KB is still the king of 'phones. Mrs. W4KB keeps the 7000-ke. crystal rig hot. We would like to hear from W4ALN. W4ZZR in Md. wants schedules with the West Fla. gang. W4SZ is now an Ensign in the U.S.N.R. W4BEW is heard with a rapid fire bug. W4BFD is our newest ORS. W4BNE has been having receiver trouble. The recent hurricane removed the old tower at W4ATN. W4BGA has worked all districts. W4ART is active on 3500 kc. W4UW-W5NO has been busy at WCOA. W4MX has applied for station license renewal. W4CV-W4ZZAE promised crystal control. W4KB visited W4QU. W4VR was caught building a new transmitter. W4ASV-W4ZZW has been having MG trouble. W4BKQ is studying for the exams. W4AOO still clings to 1750 kc. W4AQY-W4PDG wants an O.O. appointment. W4AUW says the DX bands are cutting up again. W4MS-W4ZZP now has transmitters on 3500 kc. and 7000 kc. We heard that the "YL" had W4AWJ.

Traffic: W4AGS 5, W4KB 13, W4AXP 2, W4AQY 15, W4ACB 6, W4AUA 20, W4QR 4, W4AUW 9, W4ASV 8, W4BGA 16, W4BFD 7, W4BNE 3, W4AUV 1, W4MS 39.

EASTERN FLORIDA — SCM, Ray Atkinson, W4NN — The Seminole Club of Jax hold the record for members reporting traffic, 11 reports were received. W4BG-NDU had the largest report, followed closely by the Lake Worth Radio Club station W4AWO. W4MF had the largest total reported from the 'phones, followed by W4ASQ. During the recent storms, W4ACZ acted as key station with the following line-up: W4DU, W4MF, W4WM, W4WS, W4UH, W4ANR, W4CJ, W4KM, W4BAM and W4AFV. W4CJ at Miami bit off all his fingernails when the power lines went dead during a storm there. W4AZB, Official Observer for East Fla., reports that 5 W4 stations were logged in the wrong place last month. W4DT is back with us again. W4AII has a new c.c. rig. W4ZU blew his rectifiers. W4BJS is building new c.c. job. W4BMN says his 'phones are A.W.O. W4TK is announcing the time at WJAX, as are W4AKL and W4HZ. W4NN and W4HZ were standing by for storm dope during the Gulf disturbance. W4BOT is located at 518 East Idlewild Ave., Tampa. W4GS kept 24-hour watch with W4QV using 30-minute schedules during storm. W4BIN is a new station. W4AGJ took a vacation in New York. W4VP reports conditions bad at Daytona. W4AYJ is active on 56 mc. W4BIF says traffic handling is

the "berries." W4PBM, the Seminole Club station, are up a stump as to how to keep out elevator noise in their receiver. W4UX is banging away at DX. W4HY asks "Why is an AC receiver?" W4NN feels the same. W4AKH is bound to work Asia with his PDC signal. W4DE, W4BKX, and W4BHW report traffic. W4BGR is one of our newest traffic men. W4AZB says life is just one QSL after another. W4HC has deserted us for school. W4PDE has a new portable MOPA. The Naval Reserve gang at NDU are having 100% drills at Jax and invite all hams to meet with them any Thursday evening. W4BNR is keeping schedules with CM2CF. W4AJX received his WAC certificate. W4ALP is building a 1 KW outfit.

Traffic: W4BG-NDU 150, W4AWO 68, W4NN 39, W4UX 20, W4BGR 18, W4BIF 16, W4AKH 15, W4GS 15, W4MF 14, W4BMN 13, W4AGB 13, W4BGG 11, W4AZB 10, W4BDM 10, W4PBM 6, W4VP 6, W4DE 6, W4ZU 8, W4AII 6, W4ASQ 5, W4BHW 5, W4BKX 3, W4AFV 2, W4BIN 1, W4BOT 1, W4TK 1, W4BNR 9, W4AJX 10, W4ALP 13.

ALABAMA — SCM, L. D. Elwell, W4KP-W4PAI and W4ZZN handled traffic from Alabama National Guard meet at Camp McClellan. W4AQO is having trouble with receiver. W4GP has been visiting. W4NU has not been heard since the hurricane. W4OA thanks W4BGE, W4MF, W4DU, W9FZL and others who stood by during the recent hurricane. W4AAQ has been visiting Mobile. W4AJC is on the go. W4BAU has a new 150-watt crystal 'phone. W4ADJ is working on new rig. W4EA is on 1.75-me. 'phone. W4ALA is a new ORS. W4 "BCL" is a ham! W4BDH and W4BMF are now c.c. W4AP, W4AEZ and W4RS are in the A.A.R.S. 'phone net. W4APU is being examined for ORS. W4DD is new OBS in Birmingham. W4BFP has a nice schedule. W4BAI is in the A.A.R.S. CW net. W4PDX blew his '66s. W4VV is to move. W4AWM reported. W4APJ is out for schedules. W4BGO works six districts easily. W4HO is at WSFA. W4AG and W4AHU is rebuilding. W4AKX and W4KO are looking for the RI. W4AJP blew a fifty. W4AGI works over seventy-five VEs in a month. W4BEP reported traffic. W4BMU has '45s in p.p. W4AQC is troubled by high voltage line. W4BJL, W4BGF and W4BLY are new comers. W4AXU will be back on soon. The Birmingham Radio Club is running a DX contest. W4BOE is the club Activities Manager. W4KP has new a.c. receiver. New ham in Cullman is W4BMM.

Traffic: W4PAI 130, W4ZZN 110, W4PDX 37, W4DD 24, W4BFP 17, W4BGO 14, W4AGI 13, W4APJ 12, W4BAI 11, W4AP 7, W4BEP 3, W4AWM 2, W4VV 2, W4APU 2.

WEST GULF DIVISION

SOUTHERN TEXAS — SCM, D. H. Calk, W5BHO — San Antonio: W5OW-WLJ has nice outlet for traffic to Panama, Philippines, Hawaii and China. The San Antonio Radio Club send in very nice report this month. Officers elected were: W5CS, President; W5AWY, Vice-President; W5CD, Secretary-Treasurer, and W5AOI, Sergeant-at-Arms. W5CD is building 500-watt c.c. 'phone. W5AWY is building 50-watt c.c. job. W5JC and W5VI are busy repairing BCL sets. W5MN, W5UX and W5BW are busy with A.A.R.S. work. W5CAS uses '10s. W5BVG works VEs with 2 '45s. W5BQH is off to college. W5RV is doing some nice work. W5OR is using pentode c.c. job. W5PF is getting out well. Randolph Field: W5AUC is using 2 transmitters and 2 receivers. W5BNK is off on vacation. KAINF is in Flying School. W5CBC is temporarily off the air. W5AII is going to St. Mary's University. Beaumont: W5CDM is a new 'phone station. Kerrville: W5BKE is keeping schedules with W9AWP. Seguin: W5UB and W5ALN are rebuilding. Galveston: W5ZG-VY reports new opr. born Sept. 6th. Congrats! El Paso: W5NT is home from Mexico. Corpus Christi: W5CHN has crystal rig now. W5CMO rebuilt receivers. W5BOY needs four more boys to keep him going. W5MX is consistent with Army Net. W5BZW is doing some nice work. W5FH is rebuilding. W5BRY is building portable for use at Texas University. W5CHI is back on the air. W5ZX and W5BZP are keeping the tubes hot at W5ZX. W5BZP is using MOPA. W5MS is rebuilding. W5ALV is busy with A.A.R.S. W5ARY has rebuilt. W5HP is off for awhile. Houston: W5ON is trying to out-

work W5BHO. W5TD is off for a few weeks. W5ANW is building a 100-kc. oscillator to use in O.O. work. W5ADZ worked 14 countries. Mr. Daly, an old spark man, is chief opr. at W5BXX. W5BTD is very busy with KXYZ. W5AMX is back on. W5YG is parking again. W5EI is trying to get on the air. W5TG and W5CBV are working on 56 mc. W5OX is keeping the Police Radio, KGZB, running. W5AEA is working the A.A.R.S. Officers of the Houston Amateur Radio Club are: W5ANW, President; W5BHO, Vice-President, and W5BUB, Secretary-Treasurer. Brownsville: W5PR is using 2 '45s. W5BIG is pounding brass at all hours. W5CGO has two helpers to keep his rig going. W5CKS is busy on 7 mc. Fort Clark: W5BLY and W5GJ report.

Traffic: W5OW 717, W5GJ 96, W5MS 16, W5NT 69, W5BWM 77, W5CDM 20, W5ANW 10, W5BKE 79, W5PF 8, W5ADZ 6, W5AUC 7, W5UB 8, W5BNR 165.

NEW MEXICO — SCM, Jerry Quinn, W5AUW — W5AOD is our star traffic station. W5MP has left to learn radio at R.C.A. W5BVC has new 50-foot masts. His better signs W5BUC, W5ZM-ZU is our newest ORS. W5ZA is going great on 14-me. 'phone. W5AOP has changed QRA. W5AOE likes traffic. Your SCM spent an enjoyable vacation in Southwestern Colo., where he was the guest of W9GNK. W5CPJ was a visitor at W5AUW. W5AIC has a new rig. W5CGJ can't find anyone on 7 me. who will handle traffic. W5AGP expects to be on shortly. W5CPO is a new ham in Albion.

Traffic: W5AOD 219, W5MP 58, W5AUW 47, W5BVC 22, W5ZZQ 18, W5AOE 10, W5AOP 6, W5ZM-ZU 3.

OKLAHOMA — SCM, Emil Giesel, W5VQ — W5VQ heads the list this month. W5OJ is second high man. W5BPM has steel poles at his shack. W5BVR is applying for ORS. W5MU is mostly on 3.5 mc. W5AEK handles traffic. W5AKD, W5CBY, W5MF and W5CEZ are new reporters. W5BQZ says to listen for him from W5YJ. W5BKK had his Zepp blown down three times. W5AKX reports a new ham at Bristow, W5BAR. W5ATB says OBS going OK. W5AND says W5YE will be on soon. W5AVK has joined A.A.R.S. W5BOE operated W5KB at Fair in Tulsa. W5AU reports radio business punk. The hams from Western Oklahoma held a Hamfest at W5ATO's shack on Aug. 28th, attended by W5ATO and OW, W5GB, W5AN, W5ATJ, W5ACI, Miss Tina, W5BFK and OW, W5CFN, Mr. G. O. Evans and Miss Velma Martin, W5AFB, W5CHE, W5BNL and Mr. Homer Bryant, owner of KGMP, Mr. Redman, Engineer of KGMP, and Mr. Patterson. W5BQA is awaiting license renewal. This report was prepared by W5BQA as the SCM, W5VQ is on furlough.

Traffic: W5VQ 64, W5OJ 55, W5BPM 35, W5BVR 31, W5MU 27, W5AEK 25, W5ANL 22, W5CBY 15, W5BQZ 13, W5CEZ 26, W5BKK 14, W5AKX 10, W5ATB 8, W5AND 2, W5AVK 2, W5BAR 1.

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5AVF and W5NW have been working same rig this month. W5AVF is new RM. W5BII reports the type of traffic getting better. W5IT is regular with reports. W5BTU says subscription to QST is out. W5SH attended the Olympics and operated W6USA. W5BKH reports no schedules. W5CLY says W5BRZ has been rebuilding. W5BTW is a new reporter. W5ASP is operating W5YF at SMU. W5BXV has school QRM. W5SU hopes for a '52 job. W5IA pounds out a few. W5BFI plans on a high-power rig. W5AHC wants an ORS. W5ANU is now L.N.C.S. in the Army Net. W5CHJ wants a sample copy of "Sparks." W5AUJ is putting in 211D c.c. rig. W5COX reports a club being organized at Burkburnett. W5BFY reports W5CQO a new one. W5CFM is an A.A.R.S. W5AMF reports A.A.R.S. taking all his time. W5ARV reports that ZL3CC sends him the ZL ham magazine "Break In." W5BUA, W5ARV's OM, claims to be the only Certified Public Accountant in the ham game. W5BZT is awaiting the promised ZL card. W5AID expects to go to West Gulf Division Convention. W5LY-W5ZT reports a new Jr. op. W5DO is an A.A.R.S. W5CKW is new ham in Jacksboro. W5ATC is active. W5OY reports two active stations in Nacogdoches, W5OY and W5BGC. W5AMO has been transferred to Grissom. The Cen-Tex Amateur Radio Club has been organized at Temple. Get in touch with W5BXV for details. W5AGQ is on 14-me. 'phone. W5ARK and W5AIW are getting back on the air.

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W5RJ has been snowed under with Convention plans, QST reports, "Sparks," and trying to run a ham store.

Traffic: W5AVF-NW 788, W5BII 149, W5BTU 44, W5IT 125, W5BKH 58, W5CLY 13, W5YF 7, W5BX 24, W5SU 11, W5IA 14, W5BFI 53, W5ANU 106, W5CFM 17, W5LY 3, W5DO 18.

CANADA MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — High-traffic man is VE1DI. VE1DH and 'DI have combined outfits. VE1EK is a new man. VE1EA turns in nice list of DX. VE1DQ has taken the 50-ft. stick down for painting and new wire. VE1BV is resuming schedules. Cape Breton — via VE1BM: VE1AL lost a mast in recent gale. VEICK has moved to Halifax. VE1BN is awaiting permission to use the new 'phone rig. VE1AH's first contact was W4AKH. We regret to record the passing of VE1CE. VE1DW reports for the Glace Bay boys. VE1DM blew his power supply. VE1DR reports good DX. VE1DL steps out well. VE1BR has YL QRM. VE1ED is new man. VE1AB has power supply difficulty. VE1CY has applied for OBS.

Traffic: VE1DI 63, VE1DH 46, VE1BC 43, VE1BV 20, VE1EA 9.

ONTARIO DIVISION

ONTARIO — SCM, H. W. Bishop, VE3HB — VE3MX is back from his honeymoon. VE3RK and VE3SA did some missionary work at the Ottawa Exhibition. VE3LI is rebuilding. VE3HN is back from the OFB. VE3HV is on 1.75-mc. 'phone. VE3AQ is FB 'phone work. VE3GM is on 3.9-mc. 'phone. VE3AU was QRM'd by flu. VE3PN has new transmitter. VE3LZ is coaching a new ham. VE3DZ is QRM baseball. VE3NA lost an '81. VE3BV had a visit from W2ECW. VE3GA has a low-power job under way. VE3DJ appreciates the help of the Toronto gang. Mrs. VE3DW is learning Morse. VE3IH has an MOPA. VE3GP is in Guelph. VE3GL reports the Key Klix Club will operate a station at the Y.M.C.A. Fall Fair. VE3BG has recovered from a serious operation. VE3HW has been visiting OFB stations. VE3CP and VE3DG are QRL work. VE3NL reports from Toronto. VE3LJ uses fly tox on the transmitter to get rid of the bugs. VE3LM will be c.c. with '50s in p.p. VE3RG and VE3BG are still hibernating. VE3TM is dusting off for the winter. VE3QB will be on 5 to 6 a.m. week-ends and all day Sundays. VE3DB is hunting for a 5000-volt blocking condenser. VE3DD is returning from the OFB. VE3AL expects a good turnout for the Convention. VE3HB is having keying trouble. VE3IR handles traffic on 1.75-mc. 'phone. VE3JB has increased power. VE3IR visited his brother, VE3JB. VE3AD is back home.

Traffic: VE3AU 352, VE3IR 109, VE3DW 18, VE3HB 18, VE3IH 15, VE3GL 14, VE3QB 13, VE3HV 11, VE3LI 9, VE3AL 6, VE3CP 3, VE3JB 2, VE3BV 20, VE3AD 15.

QUEBEC DIVISION

QUEBEC — Acting SCM, J. C. Stadler, VE2AP — The boys of this Division had a booth at the Radio Show. The Show was in charge of VE2CX. The committee wishes to thank VE2DX, VE2RH, VE2EM, VE2BO, VE2CU, VE2BD and VE2CO for putting on such a fine display. VE2CS and VE2AH recently paid a visit to VE2AW. VE2EK has a score of new hams in the making. VE2BG, VE2BE and VE2CA have been booking 14-mc. 'phone DX. VE2AG will be joining us soon. The SCM would like to hear from VE2JA, VE2JC, VE2EL, VE2ES, VE2EH, etc. VE2CU has returned from holiday. VE2BB pounds away.

Traffic: VE2BB 19, VE2CA 12, VE2BE 8, VE2CX 55, VE2CM 3.

VANALTA DIVISION

ALBERTA — SCM, C. H. Harris, VE4HM — VE4DT is busy with the grain rush. VE4GY is busy threshing a good crop. VE4BD at Milk River reports new ham there, VE4LD. VE4BZ was hit by lightning. VE4DQ is using remote control. VE4DR says two new hams there VE4EA is stepping out well. VE4EC is running up a score for the contest. VE4EO is planning big things. VE4FJ will soon be on.

VE4FR and VE4GT are heard occasionally. VE4HM gets good reports.

Traffic: VE4DQ 12, VE4JK 5, VE4EO 5, VE4HM 4, VE4DT 3, VE4EA 2, VE4EC 1.

BRITISH COLUMBIA — SCM, J. K. Cavalsky, VE5AL — VE5FG and VE5DZ assisted mounted police, in which VE5DZ had to walk several miles to make delivery of the messages. VE5EC handled emergency traffic for VE5GZ when the telephone lines went down. VE5HP remains one of the connecting links with Cocos Island. VE5HR threatens to bust up 28 mc. VE5GM and VE5CH moved to Vancouver. VE5EZ is on daily. VE5CT is trying new antenna. VE5FO is sporting three ops. VE5DH is top traffic man followed by VE5DB. VE5FE and VE5EW handled traffic for a local radio show. VE5FF is talking 'phone. An electrical storm just about put VE5AC out of commission. VE5AL is trying to keep schedules. VE5GT made a nice total. VE5AM is working out of town.

Traffic: VE5DH 500, VE5DB 320, VE5HP 193, VE5FE 180, VE5EW 147, VE5CH 138, VE5EC 137, VE5AC 106, VE5AL 99, VE5FG 90, VE5GT 73, VE5FF 23, VE5EZ 11, VE5HR 10, VE5CT 5.

PRARIE DIVISION

MANITOBA — SCM, J. L. Green, VE4BQ — VE4DJ hooked five VKs and a ZL. A new station appears signing VE4ZZ. VE4DK clicked TG1AA. VE4BQ popped his Belgian 200 bottle. VE4NA is making "whoopie" on 14 mc. VE4FT has migrated to 7 mc. VE4KX returned from trip to Chicago. VE4KW is QRO. VE4KU is on all the time. VE4CI keeps his antenna warmed up. VE4AG was presented with a YL junior op. VE4GC has his 75-watt heap most lined up. VE4IU is getting good results. VE4AG gets out fine. VE4GC worked a VK. VE4GG has a 50-ft. mast. The M.W.E.A. got away to a good start.

Traffic: VE4DK 10.

SASKATCHEWAN — SCM, Wilfred Skaife, VE4EL — VE4GA had visits from 27 hams. VE4FF and VE4CB visited him. VE4EH is installing crystal. Look out for new hams at North Battleford. VE4KV, VE4KB, VE4KR. Frank Vincent has an FB DX 2-tube receiver. VE4IG is moving back to Moose Jaw. VE4JH has handsome transmitter. VE4CM nearly finished MOPA. VE4JV has been transferred to Moose Jaw. VE4GR had visits from VE4KV, VE4ID and VE4EF. VE4BF says VKs and ZLs appear now about 7:30 a.m. D.S.T. The Saskatoon gang wish to add their vote of thanks to the retired SCM, Bill Pickering. VE4EL had visits from VE4FS, VE4ED, VE4KM and VE4JH. VE4ED has made contacts with a K6 and a "J." VE4BB is out of town on telephone work. The network is growing. To those who wish to join but are short a stamp, I will send one. Hi. VE4AO keeps schedule with VE4JS. VE4ES has a new rig.

Traffic: VE4CM 228, VE4GR 31, VE4HX 14, VE4JG 10, VE4EL 5, VE4JH 2, VE4CV 26.

LATE AND ADDITIONAL REPORTS

W3AAF is a new station in Bluefield. W3BZN is a new station in Norfolk. NY1AB continues his BPL totals.

Traffic: W3APF 3, NY1AB 476.

Miss W5BKV is active in Wharton, Texas.

Traffic: W5BKV 23.

Traffic Briefs

W3BF was almost arrested when he attempted to erect an antenna at 10 o'clock one night. The neighbors thought there was a burglar on the roof trying to get in a third-floor window. As a result the police received six telephone calls within a half hour and responded with bandit chasers and motorcycles. Hi.

Speaking of sky wires a new one was recently being put up at W9AYY with the assistance of W9GGZ and an aerial photographer. The wire got caught in the pulley and the a.p. proceeded to climb the thin pipe. He arrived at the top all right — but not to stay long! No, he didn't fall. He came down very gently, still holding the end of the pipe in the form of a microphone boom. W9AYY is now considering entering the mike-boom manufacturing business!



CORRESPONDENCE

The Publishers of QST assume no responsibility for statements made herein by correspondents.

Good Idea

Wharton, Texas

Editor, QST:

An idea occurred to a group of hams in this locality regarding the solution to the new license problem, and our plan might be of interest to other hams over the country.

Being in a slightly isolated section, and finding the whys and wherefores of radio rather confusing, the services of Mr. J. W. Hunt, W5TG, of Houston, Texas, were secured and night school begun in the home of the writer. This short course continued for a month, during which time intensive code work was carried on, together with the fundamentals of radio and a question and answer course. Every fellow brought up such mysteries as confronted him, and with the able assistance of Mr. Hunt and a blackboard we feel that something was accomplished. This class was drawn from four small towns in this vicinity and the individual students were both licensed and unlicensed aspirants, and ranging from twelve-year-old boys to professional men forty-five years old, fourteen students in all.

Fellows, there is always some one near you who has finished in the game and who is willing to help. For real amateur coöperation knows no bounds, and this might prove a solution to your troubles. I might add that Mr. Hunt managed very well for food and lodging while with us, and each amateur put up \$5.00. Times are thin, but the old ticket is certainly worth a fin. What say?

— Millard M. Walker, W5AHK

Two-Band 'Phone QSO's

San Marcos, Texas

Editor, QST:

An experiment attempted recently, proving very successful and presenting the 'phone man an opportunity for additional enjoyment, prompts me to submit the dope in the hope that interest can be created in the working of two-band, two-way break-in QSO's, eliminating the "'phone monologue" without the necessity for additional equipment.

Having a schedule for 1:15 p.m. with W5CEI of Austin, Texas, and arriving at the shack a little early, I tuned to 1900 ke., the frequency he oper-

ates on. Determining to find out the possibility of working break-in I switched on my transmitter, which is crystal controlled on 3092 kc. Severe feed-back resulted when the loudspeaker was used but by using headphones W5CEI could be heard very distinctly without any interference from my transmitter whatsoever. After contacting, W5CEI was asked to try reception in the same manner but due to local interference at his end he was unable to receive my signals very well. After a short time, however, W5CEI tried his receiver again and reported reception of my signals 100% on the loudspeaker. Both transmitters and receivers were on constantly and reception was perfect.

Had the transmitters and receivers been hidden out of sight one would have believed the conversation was being carried over the telephone system by land line. Another QSO late yesterday evening during a lightning and thunder storm with terrific QRN proved the dependability of operating in that manner, and I feel confident 'phone operators learning of the success of this system will be eager to try it out. Furthermore, it affords 'phone operators on both the 160 and 75 meter bands an opportunity to chew the rag without the necessity for taking turns listening and talking.

W5CEI is using a pair of 211-A tubes in push-pull with 1000 volts on the modulated amplifier and my transmitter uses one 210 in the final stage with 500 volts. Provided crystal control and selective receivers are used no difficulty should be encountered in working with any amount of power. In our case it was not even necessary to move our receivers from their normal positions on the operating table. However, we both plan to use shielded lead-ins to our receivers to minimize pick-up from our transmitters.

Here's hoping this will get the fellows started with two-band two-way QSO's! It's quite a thrill and it beats the old way by a lot. Let's hear what success you have, fellows.

— Tom Secur, W5APM

On R.A.C. vs. D.C.

Tully, N. Y.

Editor, QST:

The writer notes with much interest the letter from W8BDK appearing in the August issue of QST.



P-2-KX

60 cents

$3\frac{1}{2}'' \times 1\frac{3}{4}'' \times 4\frac{1}{2}''$
Weight $1\frac{1}{2}$ pounds

3 volts for "A" circuit

V-30-AA

\$1.50

Midget 45-volt "B" Battery for Monitors, portables and experimental work.

$3\frac{1}{2}''$ long; $2\frac{1}{4}''$ wide; $3\frac{1}{2}''$ high.
Weight 1 pound 6 ounces.

P-2-X

35 cents

$2\frac{5}{8}'' \times 1\frac{3}{8}'' \times 4\frac{1}{2}''$
Weight 13 ounces

3 volts for "A" circuit

Three New Generals Midget Series

DESIGNED by a Ham for Hams. Made in the most modern and progressive Battery Plant. Ideal for Monitors, Portables and general experimental work. The smallest and lightest Batteries on the market. Any one of them will go in your coat pocket easily. Two sizes for full voltage "A" circuits, and the Midget "B" will pack a punch of smooth, pure, quiet, sure-fire DC that will put "steam" into your Monitor or Portable. Every Battery moisture-proof. Buy direct. Use the coupon. Prices include postage anywhere in the United States.

ALSO: General V-30-DX regular size square cell 45-volt "B" Battery
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QST-11-32

Somewhat similar records have been kept at W8CSE over a period of nearly a year. Observation has covered both the 80 and 40 meter bands. The transmitter used consisted of a 245 TNT oscillator complete with its own power supply and a 210 output amplifier with 600 volts of half-wave rectified a.c. on the plate. The difference between the p.d.c. and r.a.c. was obtained by substituting a 200-ohm resistor for the 30-henry choke in the amplifier power supply.

Only approximately 23% of the calls were answered when using a p.d.c. note while about 81% produced results when r.a.c. was used. Reports received invariably favored the pure d.c. signal both in readability and strength.

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In this day of constantly increasing activity on the already crowded amateur bands there is no place for a signal that takes up four or five dial divisions and it shows the lowest and meanest form of selfishness for anyone to put out such a signal.

So let us get together in the spirit of fair play and good sportsmanship and clean up those rotten notes and broad signals and thereby raise ourselves to a place of higher respect in the estimation of our fellow amateurs.

— H. E. Preston, W8CSE

"The Truth and Nothing But—"

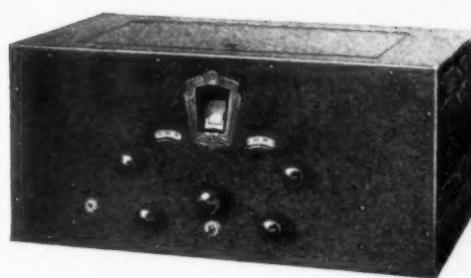
122 Linden St., Camden, N. J.
Editor, QST:

To begin with, I'm not an amateur, but so great has my interest become in amateur radio that I am a prospective one. In anticipation for examination for my license, I studied code, so to-day for a little while I donned the 'phones for practice in copying. Then — "CQ de W3" — after listening for a moment I tuned around and found W1 — calling W3 — back. So, W3 — being an obliging young ham, comes back to the "12" and says "ur sigs QSA5-R7A p.d.c. note" — some more information then "K". Back comes W1 — "ur p.d.c. sigs QSA4-R6 hr in 'Podunk'" This was fine; both boys satisfied and everything rosy, but — and what a but — *both* notes were of rawest a.c.!

This little tale is meant to be "con" — not "de" — structive, but how can a fellow know whether his junk heap is perking if such insincerity as this exists? Please keep in mind, I am not yet a ham, and my point is — what would this look like to any other fellow — not a ham? Would it increase or lower his opinion of amateurs? That's up to hams to decide.

— John M. Lennon

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Harmonics

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Editor, QST:

It is, of course, nothing extremely unusual for stations to hear and work each other on their second harmonics; however, a short time ago I worked W2DZA whose receiver and transmitter were both tuned for the 40-meter band while my receiver and transmitter were both tuned for the 20-meter band. Since this QSO was totally unarranged — we had not met previous to it — it caused us both a great deal of surprised amusement. Perhaps we would never have realized the nature of the contact were it not for the remark made by A. H. Knight, the operator of W2DZA, to the effect that he had not yet done any work on 20 meters. His remark — and the subsequent revelations — explained why it was that my signals were very weak at his station, there being but a quarter of a mile between the two stations. His signals were coming in like cannon shots.

— Charles H. Luhrs, W2CSV

Sigh With Me

Los Angeles, Calif.

Editor, QST:

Not knowing just how many years it takes to be classed as one of the fraternity of "Old Timers," I won't make any claims, but at least I have been through several periods of wild forecastings and dark forebodings.

I was just perusing some of my old radio magazines and noting some of the sets and new (?) hook-ups of that time. What memories they recall! I can still picture myself poring over the latest hook-up, critically appraising it, noting a new way to connect a coil or a new place to squeeze in a resistor. It mattered not whether the results were anywhere near what was claimed for the set. So long as the hook-up presented a different way to connect the parts, it made little difference how rotten the set worked.

I used to build crystal sets until I had exhausted about every possible combination of parts. When the magazines offered nothing new, I invented my own connections. Such experimenting was comparatively harmless and inexpensive. A good crystal set could be built in those days for around \$15. But the tube sets were different! A stage of r.f., detector, and two stages of audio delved into the pocket-book to the tune of about \$150. I'll always remember that sinking feeling when I blew nine WD-11's at a cost of \$6.50 each and dropped the tenth one.

A service kit, in those days, consisted of a pair of 'phones and a B battery. A loud click on a transformer meant the primary was O.K. A soft click was ditto for the secondary. And so it went. Everything had to click. 'Phones were tested by noting the loudness of the click when the tips were touched to the tongue (incidentally, a good way to test 'phones).

Now, what do we find? Complicated, semi-automatic receivers that only the makers know how the wheels go around. With new types of

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tubes being incorporated every day, automatic bias, automatic volume control, automatic muters, no wonder so many of us throw up our hands and shy off touching up the neighbor's sleep-killer. There are two types of radios I wouldn't touch with a ten-foot pole. One is the old reflex and the other is the latest thing out. One was too tricky to do anything with, and the other is hidden behind tin-can shielding, metal boxes, and "hands off" signs.

Harsh as this letter seems, I hold no grudge against the makers of modern receivers. They are certainly doing some fine engineering as is reflected in the high quality receivers in present day use. But who can help sighing for the good old days when a tube wasn't ashamed to show its face, and coils and condensers were above-board and handy?

Well, maybe I'm wrong, but that's what comes from digging through old magazines. Yep, it's a great life!

— W6EIJ

Five Dollars or a Million?

Editor, QST:

A million dollar service is rapidly becoming worth about five dollars. I refer to the service rendered by the Standard Frequency stations. It has become practically impossible to calibrate monitors, frequency meters, and receivers from these transmissions because of selfish and unnecessary transmissions of other stations of relatively less importance.

Those of us who have constructed our new dynatrons cannot possibly calibrate them because of the unnecessary QRM that invariably spoils our work in the reception of these signals. In the southwest portion of the United States we are not very near to the Standard Frequency stations and it is very hard for us to hear the transmissions. We can only hope that those stations on frequencies near those we desire to hear for calibration purposes will suspend operation for the half hour that they are sent.

Let us coöperate and help one another to maintain the service at the million dollar value.

— Irving Seligmann, W5UB

Summer Activities

Fairs, show stations, conventions, encampments and every-day vacation set-ups have found amateurs willing and successful in sending messages to and from friends and relatives. We are briefly mentioning several which have come to our attention. Some are bare results but all show the same spirit — pleasure derived in being of service whenever possible and for as long as necessary.

State Fair, Wheeling, West Va.

WSFJS came into being on September 4th and lasted throughout the fair, September 8th. A self-excited '52 on 3800 kc. was used for the transmitter. The booth was attractively decorated with ham embellishments including tubes for trimmings. The American Legion sponsored the fair and were very coöperative and appreciative of WSFJS. A total of 347 messages were handled

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Is accomplished by high inductance and extremely high secondary resonance frequency, permitting full bass response and complete transmission of the very high frequencies which play such an important part in achieving naturalness.

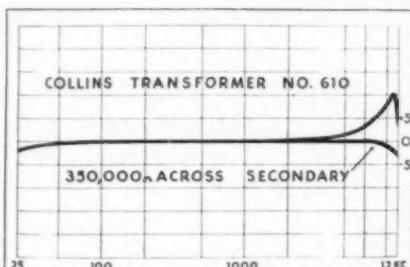
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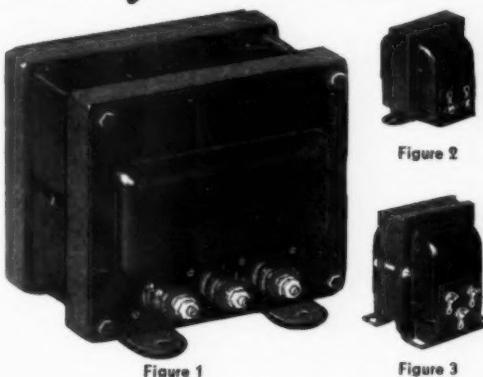


Figure 2

Figure 3

SPECIFICATIONS

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LINE-TO-GRID TRANSFORMERS (Fig. 3) . . . Price, \$4.00

610	500 ohms to single or push-pull grids.
605	200 ohms to single or push-pull grids for condenser, single or double button microphones.

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307	Plate to single or push-pull grids.
309A	Push-pull plates to push-pull grids.

TUBE-TO-LINE TRANSFORMERS — Low Level (Fig. 2). Price, \$4.00

516	Tube to 200 or 50 ohm line (20,000 ohm primary) for condenser microphone output.
517A	Tube to 500 ohm line (20,000 ohm primary).
521	112A to 500 ohm line.

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450	2-45's or '50's to 500 ohm line.
450A	2-45's or '50's to 15 ohm voice coil.
470	2-247's to 500 ohms.
470A	2-247's to 15 ohms.

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220	50-200 ohms to 50-200 ohms.
221	50-200 ohms to 500 ohms.
225	500 ohms to 500 ohms.

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715	45's or 50's to grids of 46's or '03A's (Secondary is low impedance and can be led to Class B tubes through three wire line).
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761	46's Class B to 5,000 to 6,000 ohms, for modulating 510's.
762	46's Class B to 4,000 ohm speaker.
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790	'03A's Class B to 5,000 to 6,000 ohm load, for modulating one '03A.
791	'03A's Class B to 2,500 ohm load, for modulating two '03A's.
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785	'03A's Class B to 500 ohm line.

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THE "JUMBO" EMBLEM, an attention-getter for the shack wall or that 100-footer, is a big yellow-and-black affair $19 \times 8\frac{1}{4}$ ", same style as the Automobile Emblem. \$1.25 each, postpaid.



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WEST HARTFORD, CONN.

between 11 a.m. and 10 p.m. daily. Wheeling amateurs co-operating were: W8GB, WSHD, WSBOW, WSDPO, W8FAA, WSHCI, W8CWY, WSANS, W8CSF and W8EOY.

Dauphin Island, Scene of Annual Deep Sea Fishing Rodeo

During August 8th, 9th and 10th there is held each year a fishing rodeo at Dauphin Island, off Mobile Bay in the Gulf of Mexico. It is nationally attended by experts each year and in the past the only drawback has been lack of communication of any sort. This year W4PEZ agreed to take over the problem. Schedules were arranged with Mobile, Ala., W4NU. The sleeping porch of an old army barracks, 100 feet above the ground, served as location for W4PEZ. Several important messages were handled as well as the information being transmitted on the fishing events and prizes. A gasoline generator served as the wherewithal to furnish "juice" for the transmitter and the operator even learned how to clean spark plugs before the rodeo was over.

Asbury Park "Ham Picnic"

Two hundred hams, 'phone and c.w., male and female, assembled on the Gibbs' Riding Academy Grounds September 25th. Many amateurs, including W3VX, W1AVK, W3UD, W2CGY, W2CZC, W3BFZ and W3SM, helped publicize the affair over the air before the event. It turned out to be a perfect day, both in weather and attendance and was a real ham get-together. During the consummation of eats around a circle all present had a chance to address the rest of the gang with W2AMB acting as master of ceremonies. Among the DX attendance were K6AVL, W9ATX, W5PZ and W4AFP.

Sacramento Valley ARC Handle Traffic for VFW Convention

Over 700 messages were handled at W6DKW and the members of the Sacramento Valley Amateur Radio Club deserve much credit for the performance of this station. After the affair was over officials of the VFW complimented the gang on the splendid work and service.

Aviation Unit at Cape May, N. J.

Continuous watch was held between W3UO at Cape May and W3NN at the Philadelphia Navy Yard during a two week "cruise" of the Reserve Aviation Division VN-5RDA at the Naval Air Station at Cape May. Over 500 messages were handled, the bulk of it over the above route but the following amateurs rendered invaluable aid in traffic handling: W3MG, W8DHH, W3YC, W3BPK, W8FIW and W3BEO. Members of the Aviation Unit included W3EL, W3HH, W3EO, W3AAW, W3ANE and W3BUD. The maneuvers took place during June.

Southern Minnesota Hamfest

Desiring a local get-together W9AIR, W9BKX and W9BTZ sponsored a sectional ham pep meeting. Held during September the attendance assumed the proportions of a convention with a hundred present. Demonstrations, exhibits and talks as well as a final banquet made it of interest to all.

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Transmitting key, army air corps. Silver $\frac{1}{2}$ " contacts, with blinker light. Reduced to... \$1.50



Western Electric Relay with Adjustable Platinum Contacts. Capable of controlling a load circuit of comparatively high voltage, with a very low primary consumption. (6 volt battery.) \$3.50



Army Signal Corps 20-Ohm Telegraph Sounder. For operation on 6-volt battery or dry cells..... \$1.50



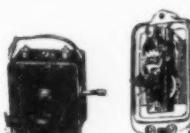
Baldwin Headphones, Genuine Micro Diaphragm 2000 ohm. Regular \$15.00 value... \$3.50



Lightning Switch, High Grade W.E. Heavy Copper Blade and Contacts, Size 7 x 8 x 6 high. While they last..... \$3.50



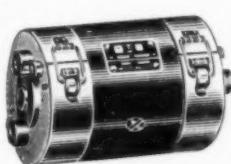
Lightning switch, ceiling type, heavy brass. Can handle 10 K.W. \$1.50



West. Elec. Lineman's tester for high res., and low circuits. Magneto and ringer. \$4.50



Selector (Call Box), Postal Telegraph type has variety of uses. \$1.00



Dynamotor 32/350 volt, ball bearing, 80 mils. Special \$9.00. Per pair..... \$15.00

NEW LOW PRICE
Dynamotor 32/350 volt, ball bearing, 80 mils. Special \$9.00. Per pair..... \$15.00

Western Electric Switch-board C.W. 928. Control board for Dynamotor System C.W. 927. Consists of starting switches, fuses, 0-50-500 volt voltmeter with switches

for testing main lines and output. Also contains complete filter system. Very special..... \$8.00

EDISON STORAGE BATTERIES



ALL TYPES 1.2 VOLTS PER CELL

A-4 Amps.	175.	Per cell...	\$3.50
A-6 Amps.	225.	Per cell...	4.00
A-8 Amps.	300.	Per cell...	5.00
B-4 Amps.	90.	Per cell...	3.50
M-8 Amps.	11.	Per cell...	1.00
L-40 Amps.	25.	Per cell...	1.50
J-3 Amps.	37.	Per cell...	3.00



L & M Type



Holtz-Cabot "Mike," Utah type, carbon granular transmitter. As illustrated. \$1.00



Navy Aircraft Dynamotor, Gen. Elec., new, 24/1000 volts, 1 amp., extended shaft with pulley, can be driven by motor, or propeller, giving 24 watts output for filament and 1000 watts for plate or driven by its own input of 24 volts. Value \$250.00. Our special price..... \$50.00

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24-750 volt Gen. Electric	200 mills	\$27.50
24-1000 Gen. Elec.	1000 mills	50.00
24-1500 Gen. Elec.	2½ kw	\$95.00
12-350 volt 80 mils	.....	18.00
12-750 volt 200 mils	.....	30.00
32-350 volt 80 mils	.....	9.00
32-300 volt 60 mils	.....	5.00
Dynamotor armatures, General Electric triple commutators, d.c. 24/1500 volt	.....	\$12.50

GENERATORS

110 volt a.c. 900 cycle, self-excited 200 watts	\$10.00
165 volt a.c. 600 cycle, self-excited 250 watts	\$15.00
110 volt a.c. 500 cycle, self-excited 250 watts	\$25.00
1500 volt d.c. 600 mils, 1 kw, Esco 1750 r.p.m.	\$15.00
240 volt 500 cycle, self-excited 2500 r.p.m., 250 watt, (also hand drive)	\$25.00
120 volt d.c. 5 kw	60.00
120 volt d.c. 20 kw	115.00
600 volt d.c. 2 kw	45.00
220 volt d.c. 500 cycle 1 kw	45.00
120 volt a.c. 500 cycle 2 kw	60.00
12 volt d.c. 60 amp.	15.00
12 volt d.c. 33 amp.	7.50

MOTOR GENERATORS

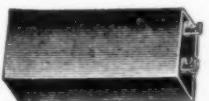
120 d.c., 110 or 220 a.c., 500 cycle, 250 watt	\$40 to \$75.00
120 d.c., 110 or 220 a.c., 500 cycle, 1 kw	\$75 to \$100.00
120 d.c., 110 or 220 a.c., 500 cycle, 3 kw	\$50 to \$150.00
120 d.c., 110 or 220 a.c., 500 cycle, 5 kw	\$95 to \$250.00
120 d.c. to 20 d.c. 2 kw	\$60.00
120 d.c. to 400 d.c. 2 kw	\$45.00
120 d.c. to 600 d.c. 2 kw	\$65.00



Compass, U. S. Army, with magnifying lens, rugged frame, needle floats in alcohol. With russet leather case. Fine for boats..... \$1.50



Complete portable telephone outfit. Has heavy bronze breastplate with 25 ft. W.P. wire and plug. Used with dry cells and 100 ohm mike transformer. \$3.95



Condensers, W. Elec. type 21A.A. 1000 volt A.C. test, 1 mfd..... \$7.50

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Anti-Capacity Switches W.E. 12 and 14 Terminals, all with Platinum Contacts, value \$3.50 each. Our price, 95¢ each.

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Lawn Bazaar Amateur Station

W1BFS was installed at a Lawn Bazaar in Mystic, Conn., recently and originated over 250 messages not to mention local interest. It was highly successful and another is to be held before this is in print.

Amateur Radio at CNG Encampment

Amateurs of the Regimental Hq. Co., 169th Infantry, Conn. Natl. Guard, manned W1EFI at Niantic, Conn., during the summer encampment and a daily schedule was kept with W1PO at Hartford, the home city of the company. Many messages were handled between the two stations.

Amateurs at Boy Scout Camp

Boy Scouts at WSZZAF, located at Mill Creek, West Va., kept in touch with home via W8GEG. The equipment at WSZZAF was built up after receiving word there was a.c. power available at the camp. Upon arrival it was found that this "juice" was three miles away. Accordingly, incidentally, being prepared, hasty changes were made and 135 volts supplied the 201-A, which was put in the transmitter and was sufficient to cover the 500-mile link. About 500 messages were handled, as well as press despatches.

W9ZZBL at Minnesota State Fair

The largest fair of its type in the world closed September 10th after a week of publicity and interest shown the amateur booth to some half million in attendance. KSTP loaned a transmitter for the occasion and as this transmitter had formerly been used to keep in contact with Byrd, there was considerable interest in the amateur booth. Originally it had been planned to handle traffic for those at the fair but FRC regs put this out of the question at the last minute.

Amateur Radio at Elks National Convention

Birmingham, Ala., was the center of Elk interest during July 11th-15th at their national convention. A steel building hampered the amateurs from handling as much traffic as possible, but over 400 messages were handled during the session. Apparatus was furnished by W4AJP and W4ASW and was set up in the registration lobby. A booth decorated in appropriate colors housed the amateur gear. Operators and clerks included W4ADL, W4AJP, W4ARR, W4DD, W4BMU and W4BBA while relaying was done by W4PAI, W4DD, W4ASW, W4ARR, W4VV, W4AGI and W4KP.

Hamfest at Granite, Oklahoma

Mr. and Mrs. W5ATO were hosts to many hams in surrounding towns during a Sunday in August. A dinner was prepared for all present and trips were taken to local spots of interest after the subject of radio had been discussed at great length and the guests left during the evening after spending a day devoted entirely to hamming.

Lions' Club Sends Greetings

Early in May the Passaic (N.J.) Lions' Club through the facilities of the Passaic Amateurs' Radio Club sent a message of good will to all

The R
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5 METER EQUIPMENT

REL equipment is the finest that money can buy. In comparing it with competitive offerings look at these points: quality, design, performance, reputation and, last but not least, price. Get REL apparatus at your dealers or direct. Descriptive bulletins on request.



The REL "300" has been designed for use at the elevated positions necessary for 5-meter DX transmission. Uses two tubes in a push pull circuit, either -01A, -45 or type -10 tubes. Eight foot tubular antenna extends above oscillator unit. All parts completely housed in one-piece metal casting. Thoroughly protected from moisture and atmospheric effects by hinged front cover and rubber gasket.

Provisions are made for hoisting or permanent fastening and for locking all controls. Only four connections required from "300" outdoor oscillator to station modulator.

Price, net to the amateur, \$31.75



The "296", a band spread receiver for 5 meters. Employs three 6-volt tubes, two type -37 and one type -38. Gives surprising results on any type of antenna. Frequency range of 55 to 61 m.c. Easily tuned with the REL noiseless vernier dial. Easily adaptable for portable work.

Price, net to the amateur, \$20.50



Here is the REL "301" modulator unit. Specially engineered to operate with the REL "300" or other outdoor oscillators. Employs two type -33 or -47 pentodes as modulators depending on oscillators used. Plate current of both the modulator and outdoor oscillator is read on the Weston meter supplied. This unit can also be used to modulate your present low powered C. W. transmitter. Price, net to the amateur, \$25.50



And now we have the REL "297". A radio telephone transmitter for 5 meters. The "297" can be operated with either of the following tube arrangements: two -01A and two -33 pentodes or two -45 and two -47 pentodes. Either of these combinations will provide unexpected results. Equipped with Weston plate current meter, single frequency control, high quality modulation — adaptable to any antenna. No further experiments required. Hook up power supply, insert tubes and it works. Price, net to the amateur, \$27.75

The Radio Engineering Laboratories, Inc. also manufacture a complete line of ultra high frequency equipment for other than amateur purposes. Submit your problems to our engineering department. Catalogs and bulletins upon request.

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A New Way to Learn the Code

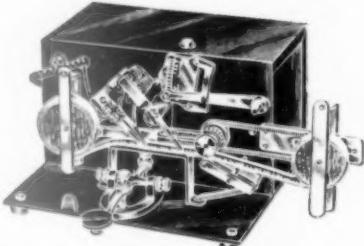
MAKE YOUR OWN RECORDS
EASY TO MAKE

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The New
MASTER

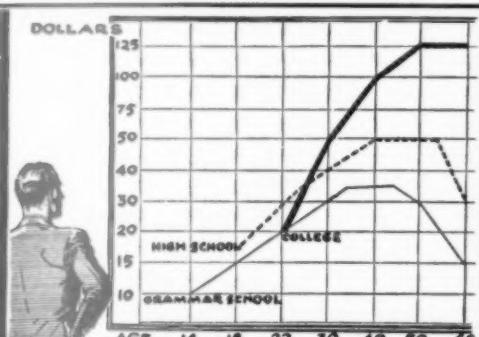
Teleplex



RECORDS your own sending in visible dots and dashes. Repeats this to you audibly on the headphones. 5000 words on each tape and number of tapes unlimited. This marvelous new invention makes learning easy and pleasant. No previous experience necessary. Anyone can master the code and pass Government examination very quickly. The New Master Teleplex is the only instrument ever made that will record your own sending and then repeat it back to you exactly as it was sent. Radio and electrical engineers agree that this is the most marvelous instrument of the kind ever produced. Originally this machine was not intended for individual instruction because it was too expensive. It was developed for the U. S. Signal Corps to be used for classroom instruction. However, we have formulated a plan whereby you may master the code without buying the machine.

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Q.S.T. II

other Lions' Clubs throughout the world. This message was transmitted from W2CXH. Among those assisting were W2BBC, W2DGY, W2CFY, W2CXH, W2AYL, W2DTO, W2AVO, W2CVY. The message was picked up from W2CXH by W5MS, Corpus Christi, Texas, and was delivered to the Lions' Club of that city. W4ACB, Tallahassee, Fla., tried to get the message but did not succeed due to bad QRM. The message is believed to have been received in many other cities.

The Hudson Division Convention

WITH nearly 500 "Hams," YL's and OW's sitting down at the banquet, this year's convention, held at the Athletic Club, Newark, N. J., on May 21st, under the auspices of the Bloomfield Radio Club assisted by the North Jersey Clubs, proved beyond a doubt that amateur radio is far from being inactive. What the convention committee was able to do in one day should be a guide to other conventions.

Dr. A. L. Walsh, director of the division greeted the delegates and gave a complete account of the Board of Directors' meeting. Informative addresses were made by Hugo Romander, W2DLM, on antennas and our good friend J. C. Warner, of RCA Radiotron, on the new tubes which have recently been released. Jim Lamb from QST who was about the big city hunting for articles gave a surprise visit and talk to the gang on "Electron-Coupled Frequency Meters." Frank Gunther, W2ALS, of Radio Engineering Labs., on "New 5-Meter Equipment." The exhibits on the mezzanine floor brought back the days of some of the early conventions and formed a very instructive display. Unfortunately space does not permit us to mention their names, but due credit has been given to all on the programs. Lieut. David Talley was busy with the Army-Amateur group and Lieut. O. G. Cope, U.S.N., representing the Third Naval District carried on the good work of the Volunteer Communication Reserve. Interspersed between meetings, H. J. Kelly, W2BTZ, had his hands full with the numerous contests and stunts which won worthwhile prizes.

The best attended event of the convention was an initiation into the Royal Order of the Wouff Hong, recently revived, being staged for the first time since its revival by the Brooklyn Radio Club. Great credit goes to Ed. Glaser, Riccobono, Wormald, Seid, Joffe, Baunach and Abramson for this performance.

A. G. Wester, W2WR, S.C.M., North Jersey took charge of the O.R.S. meeting and plans outlined for more and better activities.

And then the big event of all Hudson Division Conventions—the banquet. There is no doubt that the chef of the Athletic Club knew what he was about with the ten course dinner because it enabled that past-master of Toastmasters, Henry Shore, to fulfil his duties to the satisfaction of all. Lieut. A. A. Hebert, U.S.N.R., Treasurer, A.R.R.L., brought greetings from President Maxim and Secretary Warner. Director Walsh expressed his appreciation to the committee for its work at this

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If we have not got it we will get it for you!



Big Scoop! 25-watt tube. Just what the amateurs have been waiting for! 7½ volts filament, 850 plate volts, grid volts 75-100 ONLY \$4.75

866 Heavy duty, mercury rectifier tubes	\$1.59
866 new type, spiral filament, circular plate, extra heavy duty, uncond. guar. 1000 hrs.	\$3.35
15-watt 210's, all firsts	1.20
5-meter 210 with grid on top	2.75
New type 281M—\$1.50; 280M	.90
New type 871—\$1.50; UX281	1.39
CG-1162, 5-watt navy tubes, 4 for	1.00
RCA UX240, 75c; 3 for \$2.00; 82M	.65
UX250, big special	.65
Hytron 46 tube—75c; 56—65c; 57 or 58—80	.80
236—\$1.25; 237—90c; 238—\$1.25; 239	1.25
Speed Triple Twin—\$1.85; DeForest 510, UX-230's or 231	3.85
Rectobal R81, \$3.45; R-3	.86
Pilot Universal Super Wasp, tunes from 15 to 650 meters, all AC, new and in original cartons, list \$95.00, completely wired and assembled	5.90
Readrite set analyzers No. 710, tests 4, 5, 6, 7 prong tubes, list \$25.00, our net price	14.00

BLEEDER RESISTANCES

METERS	.79
Readrite milliammeters 0-15, 25, 50, 100, 150, 200, 300 or 400, each, 59c; 0-5 mills, \$1.15; 0-10 mills	1.00
AC Voltmeters 0-6, 0-10, or 0-15	1.50
G.E. 0-500 mills new, \$2.75, used	1.50
Weston model 301 0-50 mills, each	3.39

RELAYS

W.E. Polarized relays, 1000 ohms, DC relays, 3 mills at 3 volts, adj. shielded will follow 40 WPM, each	1.95
Mr's model relays, 40 WPM, unmounted	.59
BEEHIVE INSULATORS: standoffs, doz.	.59
Pyrex lead-in bowls	1.45
Pyrex 3" insulators—27c; 7½"—70c; 12"	2.00
Soldering Irons—heavy duty, each, 95c; extra HD.	1.65
MICROPHONES: Extra special, American Double Button Microphone type EL, THIS MONTH	5.00
Universal watch case model, single button mike	1.20
Universal Chromium plated single button "Baby" mikes, list \$7.50, new	4.20
Kodet microphone case, each	1.49
American microphone cases (chromium plate)	2.85
Universal BB mike. New model	14.00
Universal BB bullet microphone, list \$50.00, our price, lowest in country	28.00
Stand-off insulators, per dozen	.59
American type CD double button mike	11.75
Jefferson single-button mike xformers, fully shielded and fully mounted—\$1.95; Double button	2.95

CRYSTALS

Unfinished crystal blanks, either X or Y cut	1.20
Finished crystal blanks	2.00
80- or 160-meter crystal, ground to your frequency, accurate within .1 of 1%, with free bakelite adj. holder—\$4.50; 40-meter	8.00
Crystal grinding compound, per pkg.	.25
Bakelite adj. crystal holder—89c; Same but plug-in type	1.15
Precision plug-in crystal holder	1.49

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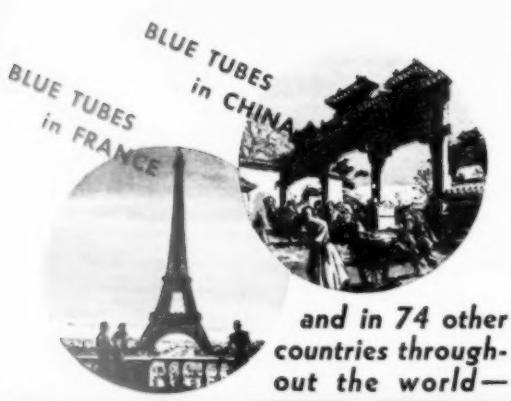
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No other radio tube has been paid as great a tribute.

In the United States, Arcturus Tubes are used by more set manufacturers as initial equipment than any other tube—a signal tribute to the quality tube.

When engineers include Arcturus Blue Tubes in their specifications, when radio jobbers and dealers offer them to the public, they have the ample justification of world-wide approval. Arcturus Radio Tube Co., Newark, N. J.

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- (B) Question is simply to overcome that inertia.
- (C) Handy coupon, plus dollar bill, does the trick.
- (D) A. R. R. L.,
38 LaSalle Rd.,
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ENCLOSED \$1. SEND HANDBOOK.

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(City and State)

convention and Walter A. Cobb, W2CO, Chairman of the convention, replied in appropriate words, sharing the credit with Akers, W2FL; Mears, W2VQ; Stricker, W2CSZ; Mustermann, W2TP; Kimmell, W2ACN; Kelly, Kaltman, McCann, Spangenberg and Shepard. Twenty-one affiliated radio clubs were represented and while we should like to mention their names space is lacking. After the distribution of prizes, the floor was cleared and dancing enjoyed by a large number, with hamfesting continuing into the small hours. Thanks, Bloomfield.

— A. A. H.

The Midwest Division Convention

REPORTING conventions is somewhat like writing a book; with a good plot it becomes a simple matter, and so it is in the case of the Iowa-Midwest Division held at Ames, Iowa, May 20th and 21st, at Engineering Hall, Iowa State College, under the auspices of the Campus Radio Club. A good program well carried out and a successful convention.

The Radio Supervisor was on the job early the first day, and well he did, because 100 amateurs took the examination and only 7 flunked; fine record, fellows. George D. Hansen, none other than W9FFD, gave a fine demonstration on five-meter transmission. Director Kerr made a complete report on the annual Board of Directors' meeting, supplementing advanced information on Madrid Conference.

A sad incident took place during the convention, but it demonstrated the strong fellowship existing in the amateur ranks. That active "ham" W9EJQ, R. P. Griffith, of Goldfield, was reported in the hospital at Fort Dodge with heart trouble; greetings and flowers were being sent him, but too late, and a wreath was substituted to show our sincere respect.

For many years Mr. D. C. Faber, Director Engineering Extension Service, has seen to it that the technical sessions would have the best of speakers, and this year's convention left nothing to be desired after listening to such speakers as Mr. E. B. Fowler, of the N. W. Bell Telephone Co., on "Fundamentals of Speech Transmission"; Mr. George K. Rollins, of the Grand Island Monitoring Station, on "Methods of Interception and Measurements of Radio Signals"; Prof. G. W. Fox, of Iowa State College, on "Recent Developments in Crystal Control." Mr. J. C. Jensen, WCAJ, had some fine slides illustrating his lecture on "Plate Supply and Filters"; Carl Menzer, WSUI, gave a fine talk on "Class B Modulation." After all these interesting speakers, the other best event was the banquet with Director Kerr as the toastmaster. The dinner was served at the Hotel Sheldon-Munn and was enjoyed by all. The convention closed with the distribution of prizes sending everybody home happy. Our thanks to the manufacturers who contributed so generously, to the Campus Radio Club and its very efficient committee.

— H. W. K. and A. A. H.

SPECIALS—THIS MONTH ONLY

Read 'Em and Weep

888's and 871's—The little 866—5000v. 300 Mil Mercury Vapor Rectifier	\$1.00
888 or 871 Filament Transformer — 2½v. 12 amps — Special	\$1.25
50 WATTERS 203A, 211, 845. Very Special	\$8.95
Full Nickel stretched gold plated diaphragm — 100 ohms per button	\$5.45
Fully cased double button mike transformers	\$1.95
Desk model nickel plated mike stand and case	\$3.00
Complete parts for making a condenser mike head, with instructions	\$4.50
Quartz Crystal blanks	\$1.00

Radiobuilders Special UX210 15 Watt Transmitting Tube . . \$1.50

Made especially for us and now in use in over 16 countries. Ask any ham that's using them. Double your present output. Use up to 750 volts on the plate. Use in Class "B" amplifiers. Oscillators, RF amplifiers. They oscillate as low as 4 meters with ease. Double Duty UX250's 100% modulators — 281's 110 mil 750 volt rectifiers Special Heavy Duty, ea. \$1.50

281M—300 Mill 15 volt drop \$1.75 872 Power 2.5 amp 10,000 v Mercury Rectifier \$11.95

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NEW	46 Dual Grid Class "B" Amplifier	56 Super-Triode Amplifier	ea. 75c
<i>2 volt tubes</i>			
55 Duplex Diode Triode	57 or 58 Triple Grid Super Amplifier		
<i>New 6 volt tubes</i>			
230 Det-Amp	Can be used on AC or DC	UX or UV 199's	\$.55
.75	236 Screen Grid	UX200A . . . . .	.40
.75	237 Det-Amp	UX201A . . . . .	.35
.75	238 Pentode	UX222 . . . . .	.95
.75	239 RF Pentode	UV224 . . . . .	.50
		UX171A . . . . .	.65
		UY224A . . . . .	.65
		235 or 551 . . . . .	.65

Mercury Full Wave Rectifiers, 300 Mill. 280M \$1.50

CG1162 Navy Transmitting Tubes, 550 plate, 7.5 volt fil. All new in original boxes \$1.25

All tubes unconditionally guaranteed ninety days against mechanical and electrical defects

MORRILL TRANSMITTING CONDENSERS

Test voltage 2000v.	3000v.	4000v.	6000v.	10,000v.
Working voltage 10000v.	1500v.	2000v.	3000v.	4,000v.
1 mfd	\$1.65	\$2.10	\$3.75	\$6.60
2 mfd . . . . .	.75	3.45	6.75	10.05
4 mfd	4.95	6.00	11.70	19.50

Condensers guaranteed one year against defects

Beehive Standoff Insulators, best quality Brown Glaze finish, Each	\$.85
25 mfd 25v C Bias bypass condensers, each . . . . .	.40
C. T. Resistances — 10, 15, 20, 25, 60, 75, or 100 ohms . . . . .	.15
83 Millihenry R. F. C.'s for SW Receivers . . . . .	.15
Pilot Midget Var. Condensers, 100 mmf, .0001 . . . . .	.60
.50 mmf, .00005 . . . . .	.55
25 and 15 mmf . . . . .	.50
A.R.R.L. Hand Books	\$1.00
A.R.R.L. Log Books . . . . .	.40
Complete line Cardwell Condensers in stock. Special for 5-meter sets 404B	\$1.44
410B dual	\$3.48
5-meter Receiver Long Wave Oscillator Coils each	\$.40
Here's a New service gang — We have a new bulletin ready to ship you which lists, part for part, every set described in the "Hand Book," ninth edition. Also list for all sets described in QST and Short-Wave Craft. Send 5¢ stamp for all dope — 15 pages of prices on kits. All parts in stock to build the new "Single Signal Receiver." Dubilier Condensers, 8 mfd 500 volts working	\$.65
1/4 KW Silver Contact transmitting Keys, Each . . . . .	.95
Latest Amateur Call Books . . . . .	.85
Copper Coil, 3/4" diameter, 14" tubing, per turn . . . . .	.07
85 watt grid leaks, 10,000, 15,000 ohms, Each . . . . .	.65
85 Millihenry RF chokes . . . . .	.15

100 Watt	5000, 10,000, 20,000 ohms	\$1.40
Bleeder	| 50,000, 75,000, or 100,000 ohm	\$1.80
Resistances	75,000 ohm with six adjustable taps	\$1.90
9 1/2" long	| 100,000 ohm with six taps	\$2.00
Accurate black flange flush panel mount meters.		

Milliammeters 0-10, 0-50, 0-100, 0-150, 0-200, 0-300, \$1.00

A.C. Voltmeters 0-3, 0-5, 0-7 1/2, 0-10, 0-15, each \$2.50

Another batch of those 1000-volt oil impregnated condensers. Uncased — Make a 1000-volt filter at practically no cost.

1 mfd \$1.15 2 mfd \$4.40 3 mfd \$5.50 4 mfd \$6.00

6 mfd \$6.80

5" x 6" x 9 1/2" Monitor Cans \$1.00

Red Devil Standoff Insulators, each \$.04

Mica Condensers, all capacities, 800 volts. \$1.15 1000v. \$.20

Tube Shields. For all standard tubes, each \$1.15

PLATE POWER TRANSFORMERS

250 watts — 750v. 0-750 and 7 1/2 and 7 1/2	\$ 5.50
350 watts — 1000-0-1000	\$ 7.50
500 watts — 1500, 100-0-1000, 1500	\$ 9.60
850 watts — 2000, 1500-0-1500, 2000	\$12.75
900 watts — 2500, 2000-0-2000, 2500	\$14.25

Finally mounted in aluminum case. Terminals on back —

lite panel

866 Transformer, In Beauty of a case with Stand-off Insulators. Tested at 15,000 volts, 2 1/2 volts 10 amps, center tapped	\$4.00
Uncased — Unmounted 866 transformers. Price	\$2.75

210 Filament Transformers 7.6 volts, center tapped, each \$.95

In stock and on demonstration. Hammarlund "Comet Pro"

Pro chassis, less tubes \$84.00

Comet Pro in Cabinet \$88.82

National "SW3" less coils \$20.88

No. 12 Enamelled Antenna wire, one piece 100' \$.75

400' \$4.40 300' \$2.00, or cut to exact length required for 16 pc for 100 ft

GE Neon Lamps — Excellent for locating stray RF and in wavemeters. 1 1/4-1-watt sizes. Each \$.55

Midget Power Transformers, 350-0-350, 5v, 2 amps

2 1/2 v 7 amps. Fully mounted. Special price \$1.50

Insulating Grommets for aluminum panels. 15 for \$.25

Amateur Band Quartz Crystals, 80 or 160 meters \$3.95

Radiobuilders plug-in crystal holders with GR plugs.. \$1.50

RADIOBUILDERS 200-WATT FILAMENT POWER TRANSFORMERS

11 volts, 15 amps for 4-50 watters, center tapped, cased	\$5.50
12 1/2 v 18 amps CT for 2 to 3 — 250 watters, cased	\$5.75
5 vols, 20 amps CT 20,000-volt insulation for two 872's	\$6.00

The above transformers are very conservatively rated.

The weight of each is 15 lbs. They are fully cased in a black crystalline finish can. Porcelain standoff insulator terminals. We invite comparison.

ALL SIZES MAGNET WIRE IN STOCK

16-18	20-22	24-26	28-30	32-34
\$.15	\$.18	\$.20	\$.25	\$.30
.20	.23	.25	.30	.35
.30	.33	.35	.40	.45
.45	.48	.50	.55	.60

Above prices are for 1/4-lb. spools only. Other sizes in stock.

All merchandise guaranteed. Terms Cash or C. O. D. All prices F. O. B. Newark, N. J. No deposit required on orders under \$5.00. 20% required on all orders over \$5.00. Please include postage. New catalog will be out shortly. Get your name on our mailing list.

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OUR SPECIALIZED EQUIPMENT FOR AMATEURS AND COMMERCIAL TRANSITTERS & RECEIVERS
DESCRIBED IN OUR CATALOGUE IS GUARANTEED

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If you want to be a High Speed, Expert Operator write CANDLER for Free Advice

GET YOUR SPEED where the Champions got theirs CANDLER Scientific Method, High Speed Telegraphing

If you want to copy press — send perfectly at 35 wpm or more with bug or key — copy 3 to 5 words behind — O. K. instantly — write Candler for free advice. THE CANDLER SYSTEM of High Speed Telegraphing trains your Brain, Muscles and Nerves to COORDINATE in doing fast, accurate work. It gives you CONFIDENCE, natural CONCENTRATION and banishes Nerve Strain. Original CANDLER METHODS have developed over 45,000 of world's fastest Morse and Radio operators including the champion.

TELEGRAPH-TOUCH-TYPE-WRITING — only method for operators. Shows how to use "mill" in receiving.

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3 Times World Champion Operator Candler Trained

"By applying Candler System methods I won the Radio Telegraphic Championship of the World 3 consecutive years at 50, 55 1/10 and 56 1/2 wpm. I say to all Commercial and amateur operators, by all means take Candler High Speed Telegraphing and 'Mill' Courses."

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Code Specialist,
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QST Oscillating Crystals

"SUPERIOR BY COMPARISON"
SINCE 1925

COMMERCIAL AND BROADCAST STATIONS

We are at your service to supply you with HIGH GRADE CRYSTALS for POWER USE, said crystals ground to an ACCURACY of BETTER than .03% fully mounted in our Standard Holder. TWO DAY DELIVERIES. Prices as follows:

FREQUENCY RANGE

100 to 1500 Kilo-cycles	\$40.00
1501 to 3000 Kilo-cycles	\$45.00
3001 to 4000 Kilo-cycles	\$50.00
4001 to 6000 Kilo-cycles	\$60.00

Special Prices Quoted for Quantities of Ten (10) or More Crystals

AMATEUR BAND CRYSTALS

Prices for grinding crystals in the Amateur Bands below are for a crystal ground to within 10 Kilo-cycles of your specified frequency unmounted. Mounted in our Standard Holder \$5.00 additional. Frequency calibration of the crystals are BETTER than .1%. Immediate delivery.

1715 to 2000 Kilo-cycles, \$12.00 each. Two for \$20.00
3500 to 4000 Kilo-cycles, \$15.00 each. Two for \$25.00

LOW FREQUENCY CRYSTALS

Low frequency crystals available to as low as 13,000 CYCLES. Prices upon receipt of specifications.

SCIENTIFIC RADIO SERVICE

"The Crystal Specialists"

124 Jackson Ave., University Park, Hyattsville, Md.

Strays

The Nassau Radio Club of Oceanside, L. I., held a picnic, hamfest, and field day in early September in one of the state parks, drawing 150 hams and YL's from the surrounding territory. All in all it was quite an expedition, complete with a sound truck and five different portable 5-meter stations, the latter having a fine time working each other. Sports, too, including horseshoe pitching, a baseball game between the Nassau Club and the Radio Club of Brooklyn (this was reported by 6 meters to the sound truck at the shelter house, where it was put on the speakers for the benefit of those who did not go to the game) and a shoe race, the winner of which got a crystal holder as a prize. And of course, eats! A swell time was had by all, and it's going to be an annual affair from now on.

Big



Special 210's
Put a set
difference!

210.....

Con
Values that
water! Better
quantities are
All ratings
and every con-
sideration.

Gen
Metal C
92 mfd. 600
3 mfd. 800
2 mfd. 1000
18 mfd. 1000
RCA 2 mfd. 1000
Tobe 2 mfd. 1000
Aerovox 2 mfd. 1000
1250 volt
Tungsol 1 mfd.
Faradon 2 mfd.
RCA Blocks of
to 1000 volt
rating. Three
Elkus 8 mfd. 1000
Metal casings

Gen
Fibre C
1/2 Mfd. 1000
2 Mfd. 1000
8 Mfd. 800
15 Mfd. 800
Faradon 2 Mfd.

Trans
THORDARSON
1/2 Mfd. 1000
7/16 c.t. 2500
Completely
Others
for
Midget power
5 Volt, 12 V
Thordarson, I
MA, 7/16, 7
center tapped
with leads
Watts 9 lbs.
Special Filament
properly mounted
All
All
lated for 2,000
1/2 volts at 4
1/2 volts at 4
1/2 volts at 10
1/2 volts at 4
1/2 volts at 4
1/2 volts at 3
at 3 amps.

BUY
AT H

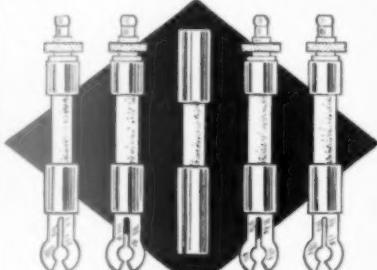
W4AKJ has a suggestion that should help some hams in tuning an m.o.p.a. transmitter to a single-wire feed antenna. With the amplifier disconnected, clip the feeder on the oscillator tank and tune to resonance with the antenna, at the same time noting the monitor or frequencymeter setting at which the signal appears. Then disconnect the feeder, hook on the amplifier, re-tune the oscillator to the same frequency, and adjust the amplifier. The feeder can then be clipped on the amplifier tank with the assurance that the antenna is being fed at the right frequency.

Dr. Cyriax' record of holding one call at one location for twenty years has inspired Warren M. Andrew, of Denver, to claim quite a different sort of record — the most calls at the most different addresses. We quote from his letter: "Started in 1909 in Greeley, Colo., with the single letter "A" as a call when a city block was DX. Graduated to "MA" in 1912 in Boulder with 90 miles exceptionally good DX. Went to Cleveland when it was headquarters for the 9th district and took an exam to bring back 9HA to Colorado as the first examined licensed call in the state. The war and then 9DRC at Boulder, followed by 7HN at Great Falls, Mont., 9CPK Denver, 5ARL Lubbock, Texas, 6DRL Los Angeles, W5AIE-W5ZZA Albuquerque, N. M., and now W9IVT-W9ZZAE back in Denver, to say nothing of a hitch at a broadcast station and two ship stations, together with two other portable calls. That makes 12 amateur calls in four districts, three commercial calls on land and sea, and in the game some 22 years plus — and still going strong!"

W2AUL has been very successful in cutting finished crystals and oscillating blanks into sections by placing the blank or crystal on a flat piece of wood and sawing carefully with the back of a hacksaw blade, using "F" carborundum as an abrasive. In several instances he has cut one-inch

Order a Set of
Centralab
Motor Radio
Noise Suppressors

Get 50% to 500% more efficiency with these sturdy suppressors. Priced Right.
 Set of 5 for 4-cyl. car. Retail Price \$2.00. **\$1.10**
 Your Price
 Set of 7 for 6-cyl. car. Retail Price \$2.75. **\$1.50**
 Your Price
 Set of 9 for 8-cyl. car. Retail Price \$3.50. **\$1.90**
 Your Price



Centralab
 Central Radio Laboratories
 Milwaukee



Join the Red Cross

square crystals into four parts and by edge-grinding has succeeded in developing four crystals where there was only one before. By finishing one side of each of the crystals slightly they can all be put on different frequencies. Cutting through the crystal takes about a half hour using the method described above. All of the crystals were "Y" cut.

W1ANC's eagle eye spotted an ad for an auto "B" eliminator which is supposed to deliver 80 watts with only a 10-amp. intermittent drain from a 6-volt storage battery. Combine this with what you could save using Listerine toothpaste and a G. E. refrigerator and the depression is all over, says Harry!

Standard Frequency Transmissions

(Continued from page 28)

TRANSMITTING PROCEDURE

The time allotted to each transmission is 8 minutes, divided as follows:

2 minutes — QST QST QST de (station call letters).
 3 minutes — Characteristic letter of station followed by call letters and statement of frequency. The characteristic letter of W1XP is "G"; that of W9XAN is "O"; and that of W6XK is "M".

1 minute — Statement of frequency in kilocycles and announcement of next frequency.
 2 minutes — Time allowed to change to next frequency.

ACCURACY

Although the accuracy of the transmissions is not guaranteed, those of W1XP are usually dependable to 0.001 per cent and those of W9XAN and W6XK to 0.01 per cent.

THE TRANSMITTING STATIONS

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Howard A. Chinn in charge.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

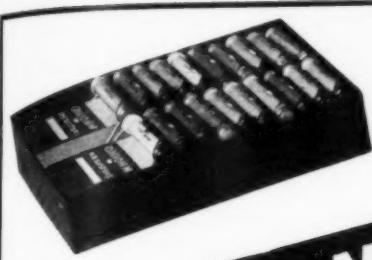
REPORT BLANKS

Blanks for reporting on the S.F. transmissions will be sent postpaid upon request. Just send a card or message to Standard Frequency System, QST, West Hartford, Conn., asking for s.f. blanks.

wvv 5000-KC. TRANSMISSION

The 5000-kc. transmissions of the Bureau of Standards station, WWV, are given every Tuesday from 10:00 a.m. to 12 noon and from 8:00 to 10:00 p.m., E.S.T. The accuracy of these transmissions is to better than 1 cycle (one in five million). Information on how to receive and utilize the signals is given in Letter Circular LC-335, obtainable on request from the Bureau. Communications concerning these transmissions and reports on their reception should be addressed to Bureau of Standards, Washington, D. C.

— J. J. L.



FIRST-AID RESISTOR KIT
Pocket size. Furnished in 1-watt and 2-watt types. Protect-O-Packed to keep wire-leads straight. Each unit stamped with value. Includes free supply of service labels.



WANTED

**5000
RADIO MEN
WHO
WANT
TO MAKE
EXTRA
MONEY**

Since radio receivers have become so popularly equipped with resistors, a new service has been created — for resistors, like other parts, cannot go on forever. "Look to your resistors" has become an important by-word when sets are not performing satisfactorily. This is but one of the opportunities OHIOHMS offer the service man.

OHIOHM RESISTORS

THE OHIO CARBON COMPANY
12508 Berea Rd. Cleveland, Ohio

SPARK SUPPRESSOR SETS
for eliminating ignition interference on 4, 6, or 8 cylinder cars. Contain condenser and necessary suppressors.

OHIOHM Resistors are made in Canada by C. C. Meredith & Co., Ltd., Toronto.

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CLEANAIRE

*Ice-Box and
Refrigerator*

DEODORIZER

*Absorbs and destroys
food odors*

ASK FOR DETAILS

Get Started in RADIO



Educational Department

WEST SIDE YMCA 4 West 63d St.
New York

RADIO INSULATORS



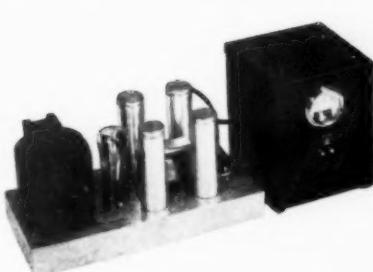
M. M. FLERON & SON TRENTON NEW JERSEY

"EMP-LAB"

FOR LESS THAN \$20!

Here is the famous EMP-LAB PXO-1 crystal controlled transmitter & power supply. All tubes, x-tal ground 1/10 of 1% your spec. freq., milliammeter, metal cabinet, vernier dial, power supply chassis cadmium plated, assembled, wired and tested. Additional stages may be purchased with power supplies to obtain frequency doubling advantages or increase power. Amplifiers may be modulated for phone. Power supplies sold separately. Write for further information and our complete parts catalog.

EMPIRE STATE RADIO LABORATORIES
LYON BLOCK, ALBANY, N. Y.



**AERO TRANSMITTER**

15 to 30 Watts

Complete Phone and

C. W. Transmitter — \$39.50

Transcontinental Transmission

Price Less Tubes and Power Pack

Complete power pack for this

transmitter. Price \$14.75

Complete set of 6 tubes for this

transmitter 12.85

Write for quotations on special transmitters built to your specifications

**AERO INTERNATIONAL****ALL WAVE 11-TUBE****SUPER-HETERODYNE DELUXE**

\$29.75

Completely assembled with two matched full dynamic speakers from 15 to 550 meters. Besides the regular broadcast band it brings on loud speaker reception, foreign programs, amateurs, police calls, ships at sea, and aeroplanes. One-dial control. No plug-in coils. Latest super-phonics tubes.

Attention Hams! This set can be furnished for operation on the ham band only, for \$2.00 extra

**AERO WORLDWIDE****1-TUBE SHORT WAVE SET**

For Headphone Operation

Price \$5.95

Listen in direct to London, Paris, Berlin, Buenos Aires and other broadcasting stations throughout the world via short waves. WORLDWIDE RECEIVER gets 14 to 550 meters. Aero 2-Tube Short Wave Set, \$8.75. The same as above set but it has one stage of audio frequency added to it.

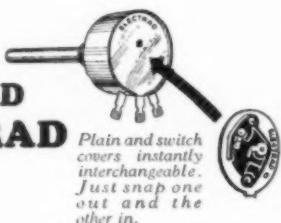
Aero 4-Tube Midget Radio, ... \$10.90

Aero 5-Tube Midget Radio, ... 11.90

Aero 6-Tube Super-Heterodyne 18.50

CHAS. HOODWIN CO., 4240 Lincoln Ave., Chicago

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**IMPROVED
ELECTRAD
Volume
Controls**Plain and switch
covers instantly
interchangeable.
Just snap one
out and the
other in.

ELECTRAD Standard REPLACEMENT VOLUME CONTROLS now have removable end covers. Just snap out the standard cover and instantly replace it with a built-in power switch, if desired.

Another popular feature of the new ELECTRAD Volume Controls is the long ALUMINUM shafts, which may easily be cut to any required length.

ELECTRAD makes the most complete line of replacement resistors and volume controls now available. They are IDEAL for service and experimental work. Ask your dealer.

Write Dept. Q-11 for
Complete, New Catalog

175 Varick St., New York, N.Y.
ELECTRAD

All-Wave Midget Receiver

(Continued from page 16)

months. It measures 8 by 7 $\frac{1}{4}$ by 8 $\frac{1}{4}$ inches, inside dimensions, and carries three Burgess No. 5308 45-volt portable type plate batteries, three No. 6 1 $\frac{1}{2}$ -volt "A" batteries, one of which is a spare, and one small 22 $\frac{1}{2}$ -volt "C"-bias battery. A plate voltage of 90 volts was first tried in order to eliminate some of the battery weight but some of the coils acted cranky and much more output was had with 135 volts, although it is possible to get by with 90 volts for plate supply if the coils are adjusted using that voltage.

The 22 $\frac{1}{2}$ -volt bias is used on the '33 and is essential. With the rated bias and 135 volts on the plate, the current is around 15 mills — too much for the headphones to carry and the cause of very short life from the plate battery. With 22 $\frac{1}{2}$ -volt bias, however, the entire plate current for both tubes is only 3 or 4 mills which is very economical of B batteries, even of the portable type used. After several months of consistent use both plate and filament batteries are still in good condition.

No provision was made to carry the coils either in the receiver case or in the battery box. However, there is sufficient room at the top of the battery box to carry the headphones and two or three coils. The coils are normally carried in a separate box.

Without an antenna the set is quiet with hardly any background noise of its own and no "outside" signals are heard. This makes it serviceable as a portable monitor and it is used for that purpose frequently. With a short length of antenna, 50 or 60 feet, the signals have about the same strength as those given by many three-tube receivers using one r.f. stage. A six-volt storage battery may be used for the filaments if necessary, which is the reason for the 60-ohm rheostat. Care must be taken not to exceed the voltage rating of the tubes because they are easily burned out. The rheostat should be turned completely off and then increased gradually until the detector starts oscillating.

After having this midget along on one vacation and getting such a kick out of hearing the old home port, it will always be part of the luggage hereafter.

BAND SPREAD COILS

Amateur Band	Grid Turns	Length of Winding	Tap			Ant. Turns
			Space	Plate	Turns	
3.5 mc.	31	1 $\frac{5}{16}$ "	19	3 $\frac{1}{16}$ "	3	3 $\frac{1}{16}$ "
7 mc.	24	2 $\frac{7}{8}$ "	11	3 $\frac{1}{8}$ "	2	1 $\frac{1}{8}$ "
14 mc.	11	3 $\frac{1}{2}$ "	2	3 $\frac{1}{8}$ "	2	3 $\frac{1}{8}$ "

Grid coils are space wound on above coils with length of winding shown in table. All grid condensers are 100- μ fd, and all grid leaks 5 megohm. Trimmer condensers have a maximum capacity of 70 μ fd. All coils are wound with No. 30 d.s.c. wire.

NON-BAND-SPREAD COILS

Freq. Range	Grid	Space	Plate	Space	Ant.
1400-2240 kc.	71	3 $\frac{1}{16}$ "	3	3 $\frac{1}{16}$ "	11
2915-4680	25	3 $\frac{1}{16}$ "	2	3 $\frac{1}{16}$ "	5
4540-7160	16	3 $\frac{1}{16}$ "	2	3 $\frac{1}{16}$ "	4
6910-10,960	10	3 $\frac{1}{16}$ "	2	3 $\frac{1}{16}$ "	5
9605-15,120	6	3 $\frac{1}{16}$ "	2	3 $\frac{1}{16}$ "	3
15,660-26,400	4	3 $\frac{1}{16}$ "	2	3 $\frac{1}{16}$ "	3

PASSING the EXAM is more important than merely taking it

MAKE sure you do not flunk out; be prepared for any question you may be asked. Typical questions, and their answers, are given in the new reprint of *QST*'s popular articles on "Passing the Government Examination for Amateur Operator's License." Originally these articles appeared in the January and February, 1930 issues; so popular were they that the entire back copy supply of these issues was exhausted within a year. Rewritten, they were again published in October and November, 1931 and reprints prepared for distribution. This supply has again been exhausted, and now —

Revised in terms of latest amateur practice, with complete information on the new amateur regulations, a new reprint of the "Passing" articles is ready for distribution. In convenient, economical pamphlet form, you can find the answer to every exam question in it. 20c per copy postpaid.

THE AMERICAN RADIO RELAY LEAGUE WEST HARTFORD, CONNECTICUT

CORNELL "CUB" CONDENSERS



PAPER DIELECTRIC CAPACITORS for radio, television and ignition, and RESISTORS for radio and television. Also Filter and By-Pass Condensers and Interference Filters. Write for your free copy of our Catalog A.

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Long Island City New York

ALUMINUM BOX SHIELDS



Genuine "ALCOA" stock, silverdip finish.
5 x 9 x 6 \$1.75
10 x 6 x 7 2.95

ANY SIZE TO ORDER

National Velvet-Vernier type F dial. Reg. Price \$4.50. Special \$1.50.
National Equitume 500 mmf. Cond. Reg. Price \$5. Special \$1.50. Please include Postage.

BLAN, the Radio Man, Inc.
177 Greenwich Street, New York, N. Y.

AMATEURS West of Rocky Mountains

We can supply all parts for
the new circuits

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Nationally Advertised
Transmitting and Receiving Parts
at LOWEST PRICES

Amateurs' Headquarters of the West

RADIO SUPPLY CO.

H. A. Demarest, President
912-914 So. Broadway Los Angeles, California
(W6FB1 located in Building)

Willie had a superhet.
He couldn't make it work;
So he got himself a Handbook
Now you ought to hear it perk.

Moral —

Send a dollar today for your copy
of the Radio Amateur's Handbook
242 pages of invaluable ham dope.

American Radio Relay League, Inc.
West Hartford, Conn.



In 3 to 7 months we train you to secure commercial license. Course consists of Wireless Code, Radio-phone, Microphone-Studio Technique, Television and Aero-nautical Radio. If further details desired, write

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PORT ARTHUR, TEXAS

Transmitting Tubes

Made by one of America's Leading R. C. A. Licensed Manufacturers. We have agreed not to mention the name of the maker.

GUARANTEED PERFECT		SUPER VALUES	
242	A New 50-watt Amplifier. Replaces 211E.	\$6.75	
845	50-watt A.F. Amplifier and Modulator.	\$8.75	
203A	50-watt Oscillator and R.F. Amplifier.	7.00	
872	Half-wave Mercury Vapor Rectifier.	8.25	
852	75-watt Oscillator and R.F. Amplifier.	12.50	
860	75-watt Screen-Grid R.F. Amplifier.	18.50	
865	7½-watt Screen-Grid R.F. Amplifier.	6.75	
210	Heavy Duty Power Amplifier.	2.50	
866	Mercury Vapor Half-Wave Rectifier.	1.50	
3A	Photo Electric Cell, Cesium Argon Type.	6.50	
	Crater Lamp — for Television.	5.50	

IMMEDIATE DELIVERY!

R. C. A. Licensed Tubes

Guaranteed 90 Days — First Quality

New 234	\$.75	112A.	\$.45	230	\$.55
" 246	.70	171A.	.35	231	.55
" 48	1.50	199X or V.	.45	232	.60
" 55	.75	201A.	.30	233	.70
" 56	.65	224A.	.45	236	.70
" 57	.70	226	.35	237	.60
" 58	.75	227	.30	238	.60
" 82	.65	235	.45	250	.75
" 83	.70	245	.35	281	.95
" 85	.65	247	.45	222	.80
" 89	.80	280	.40	280M	1.20

Special! Super-No-Aerial. **45c**

20% Deposit Required with Order.
2% Discount for Full Remittance on Order.

MERIT RADIO CO.
16 Hudson St. Room 504 New York City

THE BEST 50 WATT SOCKET Now way down in price!



Note exclusive Double Contacts. No more tubes wrecked due to contact resistance. Excellent porcelain insulation, cadmium plated soldering terminals, slotted knurled nuts, etc.

No. 211 Socket, new list price. **\$2.40**
Another new socket, very similar, but for UX base tubes. The best socket for '66 rectifiers, '52 and other transmitting tubes.

No. 210 Socket, list price. **\$1.50**



Why use bulky stand-offs? Those handy insulators you see everywhere are our No. 20, 2½" high, but only 1⅛" by 1¼" base. No. 20 Stand-off Insulator, list price **\$1.55**

Your jobber can supply these and other JOHNSON items at generous discounts, or order direct.

E. F. Johnson Co., Waseca, Minn.

All of the above coils are close-wound with No. 30 d.s.e. wire.

LOW FREQUENCY COILS

Freq. Range	Plate	Space	Grid	Space	Ind.
60-176 kc.	3.3 mh.	9½"	16.5 mh.	½"	30 mh.
166-545	340 ph.	1¼"	1.7 mh.	½"	4 mh.
509-1620	40 ph.	½"	200 ph.	1"	450 ph.

Low frequency coils are compact Diamond-weave type wound to specifications by F. W. Sickles Co., Springfield, Mass. All coils are for forms of 1½-inch outside diameter.

Third All-Section Sweepstakes Contest

(Continued from page 35)

turned here by the post office department daily because they lacked a sufficient address to insure delivery. Every message to be relayed through even one station should have the name as well as street and number and all other possible information. However, in the case of messages going direct from originator to addressee the call signal, city and state will be deemed adequate. Participants may guide themselves accordingly.

How should messages complete in other respects but bearing no signature be sent?

With the words "no sig" after a double dash at the end of the text.

What type of message texts should be exchanged in verification of a QSO? Would these be considered "rubber stamp" texts? (1) Do you think we could keep a regular schedule? (2) How many points has your station in these national tests query.

The texts are O.K. as they differ materially from each other. Many other questions or facts pertinent to the apparatus in stations, localities, opinions regarding conditions, DX, traffic or radio-phone operation, comments on the characteristics of different amateur frequencies, off-frequency operation, regulations, the interference question, high quality signals, beginners, broadcast or ship operating, organization work, Army or Navy Net operation, station descriptions, QST articles, message procedure, laws, etc., would make excellent texts for messages to be originated in the contest, not to mention the variety of non-radio subjects that could be called upon when operators in remote districts may find themselves short of regular traffic.

What about participation by the A.R.R.L. Hdq. staff members?

While stations owned and operated by members of the staff at A.R.R.L. Headquarters may participate and while the scores will count for Connecticut, the station owner and operators will be ineligible to receive any awards. The Headquarters station will transmit its regular official and special broadcasts at the usual times but whenever possible in the remaining time will participate in the contest work to add to the enjoyment and scores of those looking for QSO's.

Reports or summaries from participating stations must be received at A.R.R.L. Hdq. from all stations except those in Alaska, Hawaii and P. I. on or before noon December 24, 1932, to be counted in the results or to be considered in the awards. From those outlying points reports must be received on or before January 28, 1933. Play safe . . . mail your report immediately at the end of the contest period to avoid delay and insure that your results are credited.

A Lesson from the Commercials

(Continued from page 26)

cost was comparatively high, running about thirty dollars each as I remember it. But the records show that, after the installation of the breakers, not a single tube was lost. All of the dozen or more tubes in these three transmitters as well as

"HOW CAN I BECOME A RADIO AMATEUR

?

Are you
ever
asked
that
question?

Does your answer come easily, freely, briefly? No blame to you if it doesn't — amateur radio is a complex and diversified pursuit, and it cannot be considered in a word.

The easiest way to answer that question is to suggest that your inquirer secure a copy of the League's special beginner's booklet. It is by far the best answer you could possibly give him, too, for the 32 pages of the new second edition of "How to become a Radio Amateur" outline the entire field of amateur radio, make learning the code easy, and tell how to build a simple station, with clear illustrations and easily followed building instructions — and there's concise dope on getting licenses and operating properly, too. In short, it answers the question — thoroughly, yet simply. An inexpensive introduction to amateur radio and preliminary to the Handbook. The price is 25c, postpaid.

AMERICAN RADIO RELAY LEAGUE, West Hartford, Connecticut

FREE Amateur and Servicemen's Wholesale Guide

Hot off the press! Chock full of latest of everything for the Radio Serviceman, Amateur, Experimenter. Detailed illustrations; vital and interesting facts. Hundreds of "Hot Shot" bargains! Astonishing wholesale prices that challenge all America. WRITE TODAY for your free copy!

BURSTEIN-APPLEBEE COMPANY
100-B McGee St., Kansas City, Missouri



LOW RANGE FUSES

- Littelfuses for Instruments: Amps.: 1/100, 1/32, 1/16 — 20c ea. 1/8, 1/4, 3/8, 1/2 — 15c ea. 1, 1 1/2, 10c ea. For milliammeters, ham rectifiers, etc. Use 1/8 for radio B circuits. *High Voltage*
- Littelfuses: 1000, 5000, 10,000 volt ranges in 1/16, 1/8, 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 2 amps. Renewable. Price 35c to \$1.25 ea. Write for instructive bulletin 4-A.

LITTELFUSE LABS. 1772 Wilson Ave., Chicago

"Quicker than a Short circuit."

LITTELFUSES

MODERNIZE YOUR RADIO EQUIPMENT

Standard relay racks and panels will give your apparatus that desired commercial appearance. Our prices are right. Details upon request.

FRAZER-GLASSFORD LABORATORIES
40 East 61st Street New York, N. Y.

PANELS BAKELITE RUBBER ALUMINUM

All Sizes Cut to Order
BAKELITE TUBING & RODS

Drilling, Engraving & Special Work

ALUMINUM CANS

6 x 5 x 9, \$1.70 — 6 x 10 x 7, \$2.75 —
7 x 9 x 14, \$1.45 and many other sizes

Special sizes to order

ALUMINUM CHASSIS

Threaded brass studs for 6/32 screws
Lengths from $\frac{1}{2}$ " to 6" — price 5c to 30c

Insulating bushings
for all size shafts
from 75c to \$1.90 per dozen



Couplings in
brass or bakelite
— 15c



Transmitting frames and racks

Mail orders filled same day.

UNITED RADIO MFG. CO. Established 1922

191 Greenwich St., N. Y.

Transmitting Condensers



Dubilier brand means all types — mica, paper, oil-filled, oil-impregnated, ultra-short-wave, and now, compact electrolytics here shown. Infinitely superior workmanship and materials. Two-year service guarantee. Lowest prices.

Write for data on Dubilier transmitting condensers as well as other types in which you are interested.

DUBILIER CONDENSER CORP.
4377 Bronx Blvd. New York City

YOU CAN'T AFFORD TO BE WITHOUT THE NEW

Easy-Working Genuine Martin

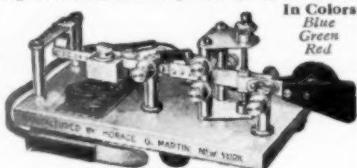
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VIBROPLEX X

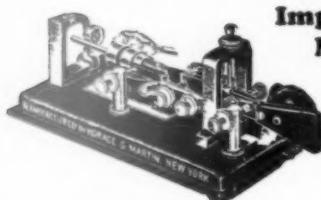
Reg. Trade Marks: Vibroplex, Bug, Lightning Bug

In Colors
Blue
Green
Red

Makes sending easy. Easy to learn. Easy to operate.



Black or Colored, \$17. Nickel Plated, \$19



Improved MARTIN Vibroplex

Black or Colored, \$17

Nickel-Plated, \$19

Special MARTIN RADIO BUG — Extra large Specially Constructed Contact Points for direct use without relay. Black or Colored. \$25

Liberal allowance on old Vibroplex.
Remit by Money Order or Registered Mail

THE VIBROPLEX CO., Inc. 825 BROADWAY NEW YORK CITY
Cable Address: "VIBROPLEX," New York

BLILEY CRYSTALS

Quartz and Tourmaline

Powerful — Accurate — Uniform Quartz Crystals supplied at your dealer close to specified frequency, 0.05% calibration: 1750, 3500Kc bands, \$5.50. 7000Kcs, \$9. Quartz mounting, \$2.50. Tourmaline Discs: 7Mc band, \$12. 14Mc band, \$14. Tourmaline mounting, \$2.50. 525Kc Lamb-super mounted crystal, \$9.50. 100Kc. Std. Freq. mounted bar, \$12.00.

BLILEY PIEZO-ELECTRIC COMPANY
Masonic Temple Bldg., Erie, Pa.

Laboratory and Kit Equipment for Service Men



Shallcross Resistors have many uses in Multi-Range Meter circuits and modern set analyzers. Our Bulletin 150-C contains many valuable charts and wire diagrams completely describing their use.

Send now 4¢ in stamps for your copy of this valuable booklet.



Shallcross Mfg. Company
ELECTRICAL SPECIALTIES
100 PARKER AVENUE
Collingdale, Pa.



those in other experimental models were still working beautifully after over four years of hard service. Simple subtraction will show the saving involved in the case of the '04-A alone.

Breakers which actually break the high-voltage circuit are unnecessary in these days of transformers and rectifiers. The type which I have previously described, which opens the primary circuit, is fully as effective and much more reasonable in price. They may be used also with motor-generator circuits by having the switch break the generator's low-voltage field circuit. It is a fact that if we operate no more than a pair of '10's a magnetic breaker will probably pay for itself the first time it operates. And that is saying something for a piece of ham equipment!

The Single-Signal Super at Work

(Continued from page 82)

same direction, the signal becomes lower and lower in beat frequency, until finally there is the silent point known as "zero beat." With the ordinary type of receiver, tuned r.f. or superhet, if you keep tuning past this point you notice that the signal then continues to rise in pitch until it disappears. Thus there are actually two places, one on each side of zero beat, where we hear the same signal. If we can "lop" off one of these sides we have room for another signal *without interference*. Within the next year or so you'll simply have to have a single-signal super to work through anything because QRM is always increasing, it is never decreasing. This receiver is honestly the answer to the ham's prayer. It's worth everything it costs.

Building a Crystal-Controlled Transmitter

(Continued from page 13)

this case also. The keying leads must be short with the latter system, however, or else must be by-passed right at the set and an r.f. choke placed in each lead at the by-pass condenser. This scheme will give less trouble from key-thumps than the plate-keying arrangement.

EXPANSION

The power output of this type of transmitter is necessarily rather small — possibly 5 to 10 watts. In a coming issue of *QST* we shall give constructional details of an amplifier unit which will permit three-band operation, as well as increased power output. The building of a crystal transmitter can be a gradual thing; it can be started off with an ultra simple one-band set and enlarged to include other bands and increased power as equipment and experience are gathered. The beauty of this plan is that nothing is wasted

— adding another stage to the transmitter is just like adding a floor to a building which has adequate foundations. A low-power crystal-controlled transmitter is a foundation for future growth unlikely to be outmoded.

Southern
A friendship
tubes unco
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UX200A...
UX201A...
UX222...

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W2C

letter

Theodore

LOW

Size — in
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15x8x8
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Southern Products Announces

A GREAT TUBE SALE AND OTHER UNUSUAL VALUES
A friendship building sale of NEW GENUINE RCA licensed tubes unconditionally guaranteed for 3 months. All "firsts."

\$.70	UV 224	\$.45	866 M. V.	\$ 1.65
.70	UV 224A	.60	886	1.85
.60	UX 226	.35	888	1.00
.50	UX 240	.45	871	1.00
.50	UX 245	.40	872	11.95
.50	UV 247	.55	875	24.95
.50	95 551 171A	.35	203A	10.45
.50	UX 212A	.60	204A	Write
.50	UV 227	.60	211	12.45
.50	295	.35	845	1.5
.50	UV 227	.70	841	8.65
.50	864	.15	R-31	3.30
.50	210	1.00	R-3	5.45
.50	210 15w.	1.40	Neon Bulbs	
.50	510 15w.	3.45	1/2w.	.50
.50	210 H. F.	2.95	1 watt.	.50
.50	280	.35	2 watt.	.70
.50	UX or UV 199	.55	Neon Telev.	2.95
.50	281M	1.60	Telev. rec.	3.95
.50	280M	.90	Photo-Elec.	4.15
.50	282	.50	Wunderfish.	.90
.50	UX 222	.90	Mercury Arcs.	

Special Tubes for $\frac{3}{4}$ meter Transmitters and Receivers. Condenser Mike Kits, W.E. type units \$3.00. Assem'd., \$8.00. Condenser Microphone and 2-stage amp. unit compl. \$20.00. Phone Break-In Equipment. Guaranteed complete automatic units can be attached to any transmitter. Write.

New Superior Var. Trans. Cond. $33\frac{1}{2}\%$ off to Hams. Southern Band Spread Amateur Receiver. Four tubes all A.C. with power pack. Plug-in coils. Complete with tubes, \$18.90. 3-tube D.C. \$13.90. 2-tube SW, \$7.45.

All Radio and Electrical Magazine subscriptions at less than publishers prices. Write, ELECTRIC Soldering Irons, 95c. Frequency Meters, Monitors calibrated. Per point, \$.50.

Dynamic Microphone, moving coil type, is now ready.

TNT Transmitter with pwr pack and tube, \$17.50. PP, \$19.50. Power Supplies complete with tubes, \$6.45, \$9.95, \$17.95.

5-Meter Super regenerative receiver \$17.95. PUSH-PULL TRANSMITTER tested, \$8.50. 8-Meter calib. wave meter, \$5.95. Star 9" receiver or monitor cans. Very special, \$1.00.

SOUTHERN PHOTO QSL's. You have seen these new clever checks and cards? Send 3c for samples and prices.

SPECIAL Beginner's Slide Rule with full inst. \$1.50.

See Our October QST Ad. Write for our ham Catalog

20% deposit on C.O.D.'s

Include Postage

SOUTHERN PRODUCTS

UNIVERSITY, ALABAMA

DUPLEX CRYSTAL OVEN

Something every modern station needs. KUP reports less than 108 cycles drift in three months. Already in use by U.S. Navy, Los Angeles Junior College, San Mateo Junior College, W8RDR, W9DRD, W6ZHZ, W6WB and many others. See August QST for details. List \$19.50 less usual discounts.

Mfd. by

Western Wireless, Ltd., 95 Minna Street, San Francisco

W2CZR YOUR CALL on PIN

Let other "hams" know who you are; wear your call letters on lapel or vest. Made to your order; chromium-plated, on pin with safety catch. Introductory price, \$1.50 — any combination of letters. Send check or money order; we pay postage. Money back if not satisfied.

Theodore Stern (W2CZR), 215 West 91 Street, N. Y. C.

LOW PRICES ON CANS!

Size — inches	Alum.	Electralloy
8x8x6	\$ 2.28	\$ 1.71
6x6x6	2.00	1.57
9x5x6	1.71	1.43
5x5x6	1.57	1.28
10x8x6	2.57	2.00
14x7x6	2.71	2.14
12x10x6	3.28	2.71
18x9x6	4.42	3.56
12x6x6	2.00	1.57
4x5x6		1.14

The above cans are supplied knocked down with drilled and tapped alum. corner posts. Write for our LOW prices on Alum. and Electralloy Panels. Our prices can't be beat. 20% deposit with all orders — postage extra. We ship any size order anywhere. We represent all nationally known radio Manufacturers. Low prices on all tubes. Write for discounts.

MAURICE SCHWARTZ & SON

710-12 Broadway

Schenectady, N. Y.

Say You Saw It in QST — It Identifies You and Helps QST

Jewell Radio Company

**POWER AMPLIFIERS
PACKS
SUPPLIES**

Distributors for the New Improved

PURADYNE PRODUCTS

Reg. U. S. Pat. Office

PURADYNE Power Transformers are designed for continuous operation at full load. The insulation test at a potential of 10,000 volts insures satisfactory operation under all possible conditions.

No. Out Put Voltage Filament Voltages Watts Price

80 2500-0-2500 850 \$12.50

80 1500-0-1500 850 \$12.50

1000-0-1000 500 9.00

50 1500-0-1500 400 8.40

48 750-0-750 400 8.40

40 1000-0-1000 400 7.50

10 750-0-750 325 5.00

10A 600-0-600 200 4.00

Shielded with stand-off insulators

No. 80 \$14.00 No. 48 \$9.90

No. 50 10.50 No. 10 6.00 10A 5.00

PURADYNE Filament Transformers, 10,000 v. insulation in metal cases with stand-off insulators: All guaranteed for six months against any defects.

ALL CENTER TAPPED:

Type Volts Amps For Tube No. Price

A 2 1/2 12 866's \$3.50

B 2-2 1/2 10 each 4.50

C 5 20 872's 6.00

D 7 1/2 7 210, 250, 281's 3.50

E 2-7 1/2 6 each 4.50

F 3-7 1/2 6 each 6.50

G 10 7 1/2 203, 211, 852's 4.00

H 12 12 204, 212 Ds 4.50

I 14 12 Special 5.50

J 2 1/2V and 10V 10-7 1/2 Special 6.50

PURADYNE CHOKES in metal cases with stand-off

insulators Type 200 and 201 no stand-off insulators

PURADYNE guaranteed transmitting filter condensers, metal cased with stand-off insulators. All condensers rated at a continuous working voltage:

Capacity 1000V. 1500V. 2000V. 3000V. 4000V.

1 mfd. \$1.25 \$2.00 \$3.00 \$6.00 \$10.00

2 mfd. 2.00 3.00 5.00 11.00 18.00

3 mfd. 2.50 4.25 6.50 18.00 27.00

4 mfd. 3.25 5.50 8.00 22.00 36.00

PURADYNE Single Button Microphone lapel type \$2.00

PURADYNE Double Button Microphones broadcast type. A REAL BUY \$9.50

Microphone Transformers single button \$1.75; double, \$2.50

PURADYNE 50 Watt Sockets, heavy duty SPECIAL \$7.50

Power Supply for 201 transmitter with only 700 volt

250 Mills, of pure D.C. current and will also supply 7 1/2V.

for 210 tubes, completely wired \$17.50; in kit form \$14.00

Power Supply for 50 Watt Transmitter will supply 1200 Vts.

at 400 Mills of pure D.C. Current and will also supply

10V for 50 Watt Tubes; completely wired and guaranteed \$32.50

250 Push-Pull Speech Amplifier using I-58 — I-227 — 2-250

and 2-281 tubes using Amertran Audio. This Amplifier has a flat frequency characteristic from 30 cycles to 10,000 cycles, ideal for Phone Transmitters and Speech Amplifiers \$30.00

SPECIALS

AMERTRAN 250 P.P. Power Transformers 700-0-700

Volts. 7 1/2V. c.t. 7 1/2V. c.t. 225 Mills. 325 Watts. \$4.75

002-5000 Volt. Pl. Bl. Cond. with Stand-off Insulators. .75

MERSHON Electrolytic Condensers, metal cases 8 mfd.

.450 Volts. .45

Voltage Dividers 18,000 Ohms for 245 P.P. 5 taps. .35

Voltage Dividers 21,600 Ohms for 210 Packs tapped. .45

Ferranti double P.P. Amplifiers uses 1-227, 2-226, 2-250.

2-281. Listed at \$250.00. Our price. .45.00

5 Ferranti's left.

Aerovox 245 condenser block 600 V. 13 mfd. 2, 4, 4, 1, 1, 1 for low power transmitters. .1.25

General Electric 5 Henry 1000 Mill. Filter Choke. .95

Lapel Microphones. .1.75

Write for catalog. It's free.

We Can Supply Anything — At Jewell's Prices — Ask For It.

Include postage with all orders and 20% deposit

against C.O.D. Shipments

Jewell Radio Company

110 Chambers St., N. Y. City

Phone Barclay 7-8937

Dept. S

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in the pursuit of their art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 15¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. This advertising of bona fide surplus equipment offered, used and for sale by an individual or apparatus offered for exchange or for advertising inquiries for special equipment, if by a member of the American Radio Relay League takes the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and takes the 15¢ rate. Provisions of paragraph (1), (2), (4) and (5) apply to all advertising in this column regardless of which rate may apply.

PLATE power for your set, the very heart of its performance, for quietness, DX ability, lifelong permanence, absolute dependability, lowest ultimate cost, no other plate source even approaches the achievement of an Edison steel alkaline storage B battery. Built painstakingly; every joint pure nickel, upset electrically welded. Genuine Edison Electrolyte. Our list describes complete batteries, construction parts, enameled aerial wire, silicon steel. Available immediately, filament and plate transformers for the new 872-866 rectifiers, complete plate power units. Rectifier Engineering Service, 4837 Rockwood Road, Cleveland, Ohio.

OVER six pounds radio data, circuits, bulletins, 50¢ postpaid. Beyond Rockies, 75¢. Klug, Kent, Ohio.

GOOD crystals — fair prices. Hollister Crystal Labs., Merriam, Kans.

QSL cards, send 15 cents for samples, new ideas, good printing. Exchange, P. O. Box 607, El Monte, Calif.

NEW Series of radiophone articles by Robert S. Kruse beginning in Modern Radio magazine. 20¢ copy, \$2.00 year. Trial subscription four months 75¢. Act now. Modern Radio, Hartford.

COMPLETE 25 watt phone transmitter. W9DDT, 20 N. Adams, Carthage, Ill.

POLITICS, policies, technical, constructional, traffic dope, everything, in "R9". Subscription \$1. Sample 20¢ (Canada \$1.75, 25¢). Box 666, Hollywood.

EVERYTHING in "ham" radio — \$1. yearly (Canada \$1.75). "R9", Box 666, Hollywood.

WUXTREE! Handsome 852 (new) xmitter with tubes, accessories, kilowatt 2200 volt power supply, \$58. Nifty three tube a.c. receiver with coils, tubes, power, \$14. W8CBG, Masury, Ohio.

BARGAINS in new transformers, all sizes; other parts. W9DQO, Route 1, Duluth, Minn.

TRADE, sell, transmitting tubes; Kennedy long wave receiver, two stage amplifier; condenser microphones; Samson MIK-1; dynatron frequency meter parts; thermo-ammeters; numerous other parts. What have you? W5AGQ.

BRAZILIAN quartz blanks, tested, guaranteed oscillators, \$1. carborundum 25¢. W9ALZ.

WANTED — small dynamotor. W9HNW.

WATS offered: 1000 volt MG; AC Tfe. super; 7.5 watt MOPA and receiver, portable, Grebe CR9. Want screw cutting bench lathe, rifle, lab. equipment, cash. List 3¢. Waller, 857 Peace, Hazleton, Penna.

BARGAINS: Brand new filter condenser blocks, 4 sections, encased in heavy metal container. Compound sealed total 13 mfd. 1000 v.d.c. Size 9x6x3 in. Guaranteed perfect. Only \$3. F.O.B. St. Louis, W9FIS, 1100 Pine, St. Louis, Mo.

SELL — Norden Hauck super DX5 SW receiver. Make offer. W8FSK, Middletown, Ohio.

OSLs — Finest printed! Service! Quality! Free prices, samples. W8DED, Holland, Mich.

RADIOGRAM cards! 200, \$1. W8DED.

OF course not. Modern Radio's no magazine for the dub — For the chaps who wants to know. It's technical, informative, wedded to engineering commonsense. Sample copy 20¢. \$2.00 a year. Edited by Kruse and Hatry. Modern Radio, 101 Allyn St., Hartford.

WILL exchange 160 or 80 meter crystals for meters or tubes. W8FN, 4021 Davis Ave., Cheviot, Ohio.

XTALS: Your approximate frequency 80 and 160 meters, \$1.35. Prepaid. One inch blanks, 65¢. Irregular shapes, 25¢. Excellent oscillators. Fisher Lab., 1200 E. Nevada, El Paso, Tex.

CLEAR edge power crystals, 1000-4000 kcs. Ys, \$1., Xs, \$1., W6ADA.

SELL: Rectobulbs R3 \$5.00. Guaranteed, perfect Crystal. Powerful, precision, 3506-3544-3646 — Others — \$5.00; 7012-7150 — Others — \$7.00. Fifty-watters, firsts \$5.00. Practically new 852 \$18.00. Several transformers cheap. W9ANY 3327 College Avenue, Kansas City, Missouri.

QSLs. Get our samples and prices before ordering. Maleo, 1512 Eastern Parkway, Brooklyn, N. Y.

STATION surplus. Write for list. Oscar W. Olsen, Jr., W9KDH, 951 Madison Ave., Hartington, Nebr.

MICROPHONES, another supply 4¢ each. With polished stand \$1.02. Two way telephone kits, complete \$2.31. Compact wall telephones \$5.90 pair. Salvage equipment. Bargain bulletin send stamp. Engineering Service Company, 1718A South 14th Street, Lincoln, Nebraska.

QSLs, two color 100, 75¢; 150, \$1.; postpaid. Samples. W9GOF, Maxham, Mishawaka, Ind.

SELL — code machine, \$12. Stanley Dau, Stillwater, Minn. WESTON meters (used) — 100 to 500 milliamperes, \$3.75; thermocouples, 1 to 5 amperes, \$6.25. Ham crystals with holder, \$5.50; 525 kilocycles, \$4.50. Transformer windings, cores. Aluminum chassis decks, monitor cases, brass corner construction. W6ELA, 105½ E. Ave. 38, Los Angeles.

QSLs, 85¢. W8AKY.

SELL — new Weston 480, 528 ammeters, \$5. Robert Base 4105 Alto Rd., Baltimore, Md.

QSLs — that speak for themselves. SWLs samples for stamp. W3BHG, 3536 Roland Ave., Baltimore.

QSLs, W6DOU, 1562 "B" St., Hayward, Calif.

SELLING OUT — Complete Push Pull 510 transmitter with 20, 40, 80 coils separate filament transformer, Weston milliammeter, voltmeter, thermoammeter and a fine business power supply. National SW 5 AC with power supply, tubes loud speaker, Baldwin fones, coils 15 to 200 meters and band spread 20 and 40. Calibrated wavemeter and Columbia monitor, key, antenna and lots of extra parts for one hundred buck cash. All best grade parts and guaranteed. Stamp for details. Fred H. Crowson, Jr., American Tel. & Tel. Co., Shreveport, La.

SELLING out, two 212Ds with sockets for only \$15. each. Tubes used very little and okay. E. T. Willes, Houlton, Me., P. O. Box 445.

TRANSFORMERS — 250 watt 1100-1500-2000 c.t. \$8.25. Quotations on request. W9CES, Frank Greben, 1917 S. Peoria St., Chicago, Ill.

FOR sale — crystal phone, power packs, s.w. receiver. Bennett Black, Rozengards, Bay City, Mich.

RECEIVERS — three tube screen grid ham sets. Shielded, sensitive, bandspread, \$11. Bernan Radio Co., 2937 West 23 St., Brooklyn, N. Y.

QSLs, 100 one color, 50¢. Two colors, 80¢. Samples. 2143 Indiana Ave., Columbus, O.

OMNIGRAPHS, Teleplexes, receivers, meters, Vibroplex, transformers, chokes. Bought, sold, traded. Ryan Radio Co., Hannibal, Mo.

QSL cards, new styles, two colors, 85¢ per hundred. Free samples. W8DTY, 257 Parker Ave., Buffalo, N. Y.

QSLs, stationery, wall cards, blanks, etc. Hillcrest, Cranerville, Pa.

QSLs. But not the usual kind. Write Box 119, West Hartford, Conn.

WANTED: Will pay cash for antique or old radio apparatus and tube suitable for ham collection. Send full details and prices. All letters answered. W6LM.

SELL or trade: 1/2 kw. screen grid tube with socket. Best offer. Want 50 watt. Frank White, 2562 Kenilworth Rd., Cleveland Heights, Ohio.

QSLs. T. Vachovetz, Elmsford, N. Y.

POWER crystals: Guaranteed excellent oscillators. X cut, one inch square, scientifically ground for maximum power at your approximate specified frequency. Calibration 0.1%, 1730 and 3500 kc. bands — \$4.50. 7000 kc. band — \$8.00. Plug-in dustproof holder — \$2.25. Special this month: Free holder with every 7000 kc. hand crystal. Crystals to other frequencies and to high accuracy quoted on request. Our fourth year in the crystal business. Prompt shipments. Precision Piezo Service, 427 Ae St., Baton Rouge, La.

SAMPLES QSL cards free. You will be surprised. Kard-Kra Press, Mishawaka, Ind.

203As brand new, late model, Westinghouse or GE \$12.00. Class B transformers pair 210 — \$7.00; for 203As — \$10.00. 10,000V heavy duty 866s — \$3.00. c.t. 866 fil. transformers — \$2.50. New RCA UX 250s — \$1.75. Weston type 301 milliameters \$3.75 (some new, all new condition, most all range 849s, 860s, 212Ds, etc. List. Edwin C. Ewing, Jr., 1057 Franklin Blvd., Chicago, Ill.

CRYSTALS: 160 and 80 meters, \$4. 80 meters for triplex \$4.40. All c.o.d. Fully guaranteed 0.1% of your specified frequency. QRG Crystal Labs., Pompton Plains, N. J.

NAMIC microphones. \$7.75 postpaid. Sensitive, rugged, background noise. Specify field resistance. Baker Engineering Labs., Fort Wayne, Indiana.

TRANSFORMERS, reactors made to your order. Real quality, quick service. Write for quotations. Baker Engineering Labs., Fort Wayne, Indiana.

ELL — two 504As, new factory sealed \$35. each, both \$60. D. C. Akers, W2FL, East Orange, N. J.

SLA — see them. Free samples. W6CKX, Los Olivos, Calif.

CODE machines, tapes and complete instruction for beginners or advanced students — both codes — for sale or rent very reasonable. Rental to apply on purchase of new equipment. Special inducement to our amateur patrons. Extra tapes for all machines. Instructograph, 912 Lakeside Place, Chicago.

HID, army rifle, 20" slide rule, W.E. 7-A amplifier. Want typewriter, meters, parts. W2BVA.

SPECIAL transmitting and receiving equipment custom-built to your requirements. Careful engineering; adequate shop facilities; good workmanship; reasonable prices. Let me quote on your job. Holmes C. Miller, Radio Engineer, Box 105, Palo Alto, California.

CRYSTALS, Brazilian quartz, c.o.d. calibrated crystals, one inch, or Y \$3.50, 50-1750 to 4000 k.c.; oscillating crystals, one inch or Y \$1.50. Unfinished blanks, odds and ends less than one in., guaranteed to make good oscillators, 60¢. Grinding carbundum 25¢ per box. William Threm, W8FN, 68 E. McMicken Ave., Cincinnati, Ohio.

QSL cards, message blanks, stationery, snappy service. Samples free. Write today. W1BEP, 16 Stockbridge Avenue, Lowell, Mass.

QSLs of distinction. Samples, prices, on request. W2AEY, 338 Elmora, Elizabeth, N. J.

VIRROPLEXES, brand new, \$12. Slightly used, \$9. Guaranteed. Frank Lydeard, 28 Circuit, Roxbury, Mass.

QSLs, two color, 100, 70¢, 200, \$1.30. W6ATG.

12D and socket, \$16. Write W9DUD.

SILVER plated copper tubing inductances now available to amateurs. W7SZ.

MATEUR and broadcast transmitters — write for list. Special orders promptly estimated. Mabbott and Chapman, Stevensville, Montana.

98.22 sale — Silver Marshall 4 tube short-wave battery set, pes. coils. Ten dollars. W. J. McGuffage, 6735 Cornell Ave., Chicago, Ill.

OR trade — Johnson sea horse, 4 h.p. outboard motor, A1 condition for transmitting equipment. W6DCI.

METERS wanted, small Weston, Jewell, milliamperes, volts, useful ranges, any condition. A. B. Clark, Albia, Iowa.

SALE or trade — Eesco motor generator, 250 watt 1500 volts. If interested write. W4OC, F. M. Whitaker, Durham, N. C.

SPECIAL, a real quality condenser mike head, competently engineered, ready to use, tested, guaranteed. \$9.90 net. 465 kilocycle crystal and holder for QST single-signal supers \$4.25. Eighty 160 meter crystal with bakelite plug-in holder, approximate frequency \$2.95. Specified frequency 0.1 of 1% \$3.95. One each Western Electric tubes, used, excellent condition, 228-A & 65, 212-A 66, 211-A 88. Quotations furnished on special equipment. Pioneer Radio Engineering Company, 5166 Pico Blvd., Los Angeles.

WANTED — Crosley bandbox. W7BPI, Celilo, Oregon.

TRADE — latest model, 21 jewel, gold, Elgin railroad watch or radio equipment. W7BPI, Celilo, Oregon.

PANELS. See Aug. QST. WSBSSR.

ELL — Two new 203-A's \$12.00; New UV-211 \$12.00; WE-1-E \$3.90; 100 miscellaneous accessories, cheap. Write for lists. Howard, 5508 Fulton St., Chicago.

UB E S — Transmitting and receiving. Lowest prices. Howard Tube Service, 3508 Fulton St., Chicago.

BEST ham receiver yet, using latest tubes, band spread, attractive, pentode. AC (self-contained power supply) \$16.95, DC battery for two volt tubes) \$12.85. 1 mfd. 1000 volt condensers, .00025, .001, .011E, \$2.79. Cardwell transmitting condensers .00025, .0005, .001, .011, .022, .044, .088, .176, .352, .704, .141, .282, .564, .112, .224, .448, .896, .178, .356, .712, .142, .284, .568, .114, .228, .456, .912, .182, .364, .728, .144, .288, .576, .116, .232, .464, .928, .184, .368, .736, .146, .292, .588, .118, .236, .476, .952, .192, .384, .768, .148, .296, .596, .120, .240, .480, .960, .196, .392, .776, .149, .298, .598, .121, .241, .481, .961, .197, .393, .777, .150, .300, .600, .990, .198, .396, .780, .151, .301, .601, .991, .199, .397, .781, .152, .302, .602, .992, .200, .400, .800, .153, .303, .603, .993, .201, .401, .801, .154, .304, .604, .994, .202, .402, .802, .155, .305, .605, .995, .203, .403, .803, .156, .306, .606, .996, .204, .404, .804, .157, .307, .607, .997, .205, .405, .805, .158, .308, .608, .998, .206, .406, .806, .159, .309, .609, .999, .207, .407, .807, .160, .310, .610, .999, .208, .408, .808, .161, .311, .611, .999, .209, .409, .809, .162, .312, .612, .999, .210, .410, .810, .163, .313, .613, .999, .211, .411, .811, .164, .314, .614, .999, .212, .412, .812, .165, .315, .615, .999, .213, .413, .813, .166, .316, .616, .999, .214, .414, .814, .167, .317, .617, .999, .215, .415, .815, .168, .318, .618, .999, .216, .416, .816, .169, .319, .619, .999, .217, .417, .817, .170, .320, .620, .999, .218, .418, .818, .171, .321, .621, .999, .219, .419, .819, .172, .322, .622, .999, .220, .420, .820, .173, .323, .623, .999, .221, .421, .821, .174, .324, .624, .999, .222, .422, .822, .175, .325, .625, .999, .223, .423, .823, .176, .326, .626, .999, .224, .424, .824, .177, .327, .627, .999, .225, .425, .825, .178, .328, .628, .999, .226, .426, .826, .179, .329, .629, .999, .227, .427, .827, .180, .330, .630, .999, .228, .428, .828, .181, .331, .631, .999, .229, .429, .829, .182, .332, .632, .999, .230, .430, .830, .183, .333, .633, .999, .231, .431, .831, .184, .334, .634, .999, .232, .432, .832, .185, .335, .635, .999, .233, .433, .833, .186, .336, .636, .999, .234, .434, .834, .187, .337, .637, .999, .235, .435, .835, .188, .338, .638, .999, .236, .436, .836, .189, .339, .639, .999, .237, .437, .837, .190, .340, .640, .999, .238, .438, .838, .191, .341, .641, .999, .239, .439, .839, .192, .342, .642, .999, .240, .440, .840, .193, .343, .643, .999, .241, .441, .841, .194, .344, .644, .999, .242, .442, .842, .195, .345, .645, .999, .243, .443, .843, .196, .346, .646, .999, .244, .444, .844, .197, .347, .647, .999, .245, .445, .845, .198, .348, .648, .999, .246, .446, .846, .199, .349, .649, .999, .247, .447, .847, .200, .350, .650, .999, .248, .448, .848, .201, .351, .651, .999, .249, .449, .849, .202, .352, .652, .999, .250, .450, .850, .203, .353, .653, .999, .251, .451, .851, .204, .354, .654, .999, .252, .452, .852, .205, .355, .655, .999, .253, .453, .853, .206, .356, .656, .999, .254, .454, .854, .207, .357, .657, .999, .255, .455, .855, .208, .358, .658, .999, .256, .456, .856, .209, .359, .659, .999, .257, .457, .857, .210, .360, .660, .999, .258, .458, .858, .211, .361, .661, .999, .259, .459, .859, .212, .362, .662, .999, .260, .460, .860, .213, .363, .663, .999, .261, .461, .861, .214, .364, .664, .999, .262, .462, .862, .215, .365, .665, .999, .263, .463, .863, .216, .366, .666, .999, .264, .464, .864, .217, .367, .667, .999, .265, .465, .865, .218, .368, .668, .999, .266, .466, .866, .219, .369, .669, .999, .267, .467, .867, .220, .370, .670, .999, .268, .468, .868, .221, .371, .671, .999, .269, .469, .869, .222, .372, .672, .999, .270, .470, .870, .223, .373, .673, .999, .271, .471, .871, .224, .374, .674, .999, .272, .472, .872, .225, .375, .675, .999, .273, .473, .873, .226, .376, .676, .999, .274, .474, .874, .227, .377, .677, .999, .275, .475, .875, .228, .378, .678, .999, .276, .476, .876, .229, .379, .679, .999, .277, .477, .877, .230, .380, .680, .999, .278, .478, .878, .231, .381, .681, .999, .279, .479, .879, .232, .382, .682, .999, .280, .480, .880, .233, .383, .683, .999, .281, .481, .881, .234, .384, .684, .999, .282, .482, .882, .235, .385, .685, .999, .283, .483, .883, .236, .386, .686, .999, .284, .484, .884, .237, .387, .687, .999, .285, .485, .885, .238, .388, .688, .999, .286, .486, .886, .239, .389, .689, .999, .287, .487, .887, .240, .390, .690, .999, .288, .488, .888, .241, .391, .691, .999, .289, .489, .889, .242, .392, .692, .999, .290, .490, .890, .243, .393, .693, .999, .291, .491, .891, .244, .394, .694, .999, .292, .492, .892, .245, .395, .695, .999, .293, .493, .893, .246, .396, .696, .999, .294, .494, .894, .247, .397, .697, .999, .295, .495, .895, .248, .398, .698, .999, .296, .496, .896, .249, .399, .699, .999, .297, .497, .897, .250, .400, .700, .999, .298, .498, .898, .251, .401, .701, .999, .299, .499, .899, .252, .402, .702, .999, .300, .500, .800, .999, .301, .501, .801, .999, .302, .502, .802, .999, .303, .503, .803, .999, .304, .504, .804, .999, .305, .505, .805, .999, .306, .506, .806, .999, .307, .507, .807, .999, .308, .508, .808, .999, .309, .509, .809, .999, .310, .510, .801, .999, .311, .511, .802, .999, .312, .512, .803, .999, .313, .513, .804, .999, .314, .514, .805, .999, .315, .515, .806, .999, .316, .516, .807, .999, .317, .517, .808, .999, .318, .518, .809, .999, .319, .519, .800, .999, .320, .520, .801, .999, .321, .521, .802, .999, .322, .522, .803, .999, .323, .523, .804, .999, .324, .524, .805, .999, .325, .525, .806, .999, .326, .526, .807, .999, .327, .527, .808, .999, .328, .528, .809, .999, .329, .529, .800, .999, .330, .530, .801, .999, .331, .531, .802, .999, .332, .532, .803, .999, .333, .533, .804, .999, .334, .534, .805, .999, .335, .535, .806, .999, .336, .536, .807, .999, .337, .537, .808, .999, .338, .538, .809, .999, .339, .539, .800, .999, .340, .540, .801, .999, .341, .541, .802, .999, .342, .542, .803, .999, .343, .543, .804, .999, .344, .544, .805, .999, .345, .545, .806, .999, .346, .546, .807, .999, .347, .547, .808, .999, .348, .548, .809, .999, .349, .549, .800, .999, .350, .550, .801, .999, .351, .551, .802, .999, .352, .552, .803, .999, .353, .553, .804, .999, .354, .554, .805, .999, .355, .555, .806, .999, .356, .556, .807, .999, .357, .557, .808, .999, .358, .558, .809, .999, .359, .559, .800, .999, .360, .560, .801, .999, .361, .561, .802, .999, .362, .562, .803, .999, .363, .563, .804, .999, .364, .564, .805, .999, .365, .565, .806, .999, .366, .566, .807, .999, .367, .567, .808, .999, .368, .568, .809, .999, .369, .569, .800, .999, .370, .570, .801, .999, .371, .571, .802, .999, .372, .572, .803, .999, .373, .573, .804, .999, .374, .574, .805, .999, .375, .575, .806, .999, .376, .576, .807, .999, .377, .577, .808, .999, .378, .578, .809, .999, .379, .579, .800, .999, .380, .580, .801, .999, .381, .581, .802, .999, .382, .582, .803, .999, .383, .583, .804, .999, .384, .584, .805, .999, .385, .585, .806, .999, .386, .586, .807, .999, .387, .587, .808, .999, .388, .588, .809, .999, .389, .589, .800, .999, .390, .590, .801, .999, .391, .591, .802, .999, .392, .592, .803, .999, .393, .593, .804, .999, .394, .594, .805, .999, .395, .595, .806, .999, .396, .596, .807, .999, .397, .597, .808, .999, .398, .598, .809, .999, .399, .599, .800, .999, .400, .600, .801, .999, .401, .601, .802, .999, .402, .602, .803, .999, .403, .603, .804, .999, .404, .604, .805, .999, .405, .605, .806, .999, .406, .606, .807, .999, .407, .607, .808, .999, .408, .608, .809, .999, .409, .609, .800, .999, .410, .610, .801, .999, .411, .611, .802, .999, .412, .612, .803, .999, .413, .613, .804, .999, .414, .614, .805, .999, .415, .615, .806, .999, .416, .616, .807, .999, .417, .617, .808, .999, .418, .618, .809, .999, .419, .619, .800, .999, .420, .620, .801, .999, .421, .621, .802, .999, .422, .622, .803, .999, .423, .623, .804, .999, .424, .624, .805, .999, .425, .625, .806, .999, .426, .626, .807, .999, .427, .627, .808, .999, .428, .628, .809, .999, .429, .629, .800, .999, .430, .630, .801, .999, .431, .631, .802, .999, .432, .632, .803, .999, .433, .633, .804, .999, .434, .634, .805, .999, .435, .635, .806, .999, .436, .636, .807, .999, .437, .637, .808, .999, .438, .638, .809, .999, .439, .639, .800, .999, .440, .640, .801, .999, .441, .641, .802, .999, .442, .642, .803, .999, .443, .643, .804, .999, .444, .644, .805, .999, .445, .645, .806, .999, .446, .646, .807, .999, .447, .647, .808, .999, .448, .648, .809, .999, .449, .649, .800, .999, .450, .650, .801, .999, .451, .651, .802, .999, .452, .652, .803, .999, .453, .653, .804, .999, .454, .654, .805, .999, .455, .655, .806, .999, .456, .656, .807, .999, .457, .657, .808, .999, .458, .658, .809, .999, .459, .659, .800, .999, .460, .660, .801, .999, .461, .661, .802, .999, .462, .662, .803, .999, .463, .663, .804, .999, .464, .664, .805, .999, .465, .665, .806, .999, .466, .666, .807, .999, .467, .667, .808, .999, .468, .668, .809, .999, .469, .669, .800, .999, .470, .670, .801, .999, .471, .671, .802, .999, .472, .672, .803, .999, .473, .673, .804, .999, .474, .674, .805, .999, .475, .675, .806, .999, .476, .676, .807, .999, .477, .677, .808, .999, .478, .678, .809, .999, .479, .679, .800, .999, .480, .680, .801, .999, .481, .681, .802, .999, .482, .682, .803, .999, .483, .683, .804, .999, .484, .684, .805, .999, .485, .685, .806, .999, .486, .686, .807, .999, .487, .687, .808, .999, .488, .688, .809, .999, .489, .689, .800, .999, .490, .690, .801, .999, .491, .691, .802, .999, .492, .692, .803, .999, .493, .693, .804, .999, .494, .694, .805, .999, .495, .695, .806, .999, .496, .696, .807, .999, .497, .697, .808, .999, .498, .698, .809, .999, .499, .699, .800, .999, .500, .700, .801, .999, .501, .701, .802, .999, .502, .702, .803, .999, .503, .703, .804, .999, .504, .704, .805, .999, .505, .705, .806, .999, .506, .706, .807, .999, .507, .707, .808, .999, .508, .708, .809, .999, .509, .709, .800, .999, .510, .710, .801, .999, .511, .711, .802, .999, .512, .712, .803, .999, .513, .713, .804, .999, .514, .714, .805, .999, .515, .715, .806, .999, .516, .716, .807, .999, .517, .717, .808, .999, .518, .718, .809, .999, .519, .719, .800, .999, .520, .720, .801, .999, .521, .721, .802, .999, .522, .722, .803, .999, .523, .723, .804, .999, .524, .724, .805, .999, .525, .725, .806, .999, .526, .726, .807, .999, .527, .727, .808, .999, .528, .728, .809, .999, .529, .729, .800, .999, .530, .730, .801, .999, .531, .731, .802, .999, .532, .732, .803, .999, .533, .733, .804, .999, .534, .734, .805, .999, .535, .735, .806, .999, .536, .736, .807, .999, .537, .737, .808, .999, .538, .738, .809, .999, .539, .739, .800, .999, .540, .740, .801, .999, .541, .741, .802, .999, .542, .742, .803, .999, .543, .743, .804, .999, .544, .744, .805, .999, .545, .745, .806, .999, .546, .746, .807, .999, .547, .747, .808, .999, .548, .748, .809, .999, .549, .749, .800, .999, .550, .750, .801, .999, .551, .751, .802, .999, .552, .752, .803, .999, .553, .753, .804, .999, .554, .754, .805, .999, .555, .755, .806, .999, .556, .756, .807, .999, .557, .757, .808, .999, .558, .758, .809, .999, .559, .759, .800, .999, .560, .760, .801, .999, .561, .761, .802, .999, .562, .762, .803, .999, .563, .763, .804, .999, .564, .764, .805, .999, .565, .765, .806, .999, .566, .766, .807, .999, .567, .767, .808, .999, .568, .768, .809, .999, .569, .769, .800, .999, .570, .770, .801, .999, .571, .771, .802, .999, .572, .772, .803, .999, .573, .773, .804, .999, .574, .774, .805, .999, .575, .775, .806, .999, .576, .776, .807, .999, .577, .777, .808, .999, .578, .778, .809, .999, .579, .779, .800, .999, .580, .780, .801, .999, .581, .781, .802, .999, .582, .782, .803, .999, .583, .783, .804, .999, .584, .784, .805, .999, .585, .785, .806, .999, .586, .786, .807, .999, .587, .787, .808, .999, .588, .788, .809, .999, .589, .789, .800, .999, .590, .790, .801, .999, .591, .791, .802, .999, .592, .792, .803, .999, .593, .793, .804, .999, .594, .794, .805, .999, .595, .795, .806, .999, .596, .796, .807, .999, .597, .797, .808, .999, .598, .798, .809, .999, .599, .799, .800, .999, .600, .700, .801, .999, .601, .701, .802, .999, .602, .702, .803, .999, .603, .703, .804, .999, .604, .704, .805, .999, .605, .705, .806, .999, .606, .706, .807, .999, .607, .707, .808, .999, .608, .708, .809, .999, .609, .709, .800, .999, .610, .710, .801, .999, .611, .711, .802, .999, .612, .712, .803, .999, .613, .713, .804, .999, .614, .714, .805, .999, .615, .715, .806, .999, .616, .716, .807, .999, .617, .717, .808, .999, .618, .718, .809, .999, .619, .719, .800, .999, .620, .720, .801,

To Our Readers who are not A.R.R.L. members

YOU should become a member of the League! That you are interested in amateur radio is shown by your reading of *QST*. From it you have gained a knowledge of the nature of the League and what it does, and you have read its purposes as set forth on the page opposite the editorial page of this issue. We should like to have you become a full-fledged member and add your strength to ours in the things we are undertaking for Amateur Radio. You will have *QST* delivered at your door each month. A convenient application form is printed below — clip it out and mail it today.

A bona fide interest in amateur radio is the only essential qualification for membership

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West Hartford, Conn., U. S. A.

I hereby apply for membership in the American Radio Relay League, and enclose \$2.50 (\$3.00 outside of the United States and its Possessions, and Canada) in payment of one year's dues, \$1.25 of which is for a subscription to *QST* for the same period. Please begin my subscription with the issue. Mail my Certificate of Membership and send *QST* to the following name and address.

Do you know a friend who is also interested in Amateur Radio, whose name you might give us so we may send him a sample copy of *QST*?

Thanks

For Your Convenience QST'S INDEX OF ADVERTISERS IN THIS ISSUE

American Red Cross	78
Arcturus Radio Tube Co.	80
A.R.R.L. Application Blank	91
A.R.R.L. Catalog	89
A.R.R.L. Emblem	89
A.R.R.L. Handbook	74
A.R.R.L. Supplies	80, 87, Cor. IV Cor. III
Blair, The Radio Man, Inc.	87
Bliley Piezo Electric Co.	90
Burstein Applebee Company	87
Candler System Company	82
Capitol Radio Engineering Institute	84
Cardwell Mfg. Corp., Allen D.	71
Central Radio Labs.	84
Collins Radio Company	73
Cornell Elec. Mfg. Co.	89
Chicago Radio Products	93
Dubilier Condenser Corp.	89
Electrad, Inc.	86
Empire State Radio Labs.	85
Fleron & Son, Inc. M. M.	85
Fraser-Glassford Labs.	89
General Dry Batteries, Inc.	67
General Radio Co.	2
Hammarlund Mfg. Co.	69
Harrison Radio Co.	83
Hoofwin Co., Chas.	86
International Resistance Co.	76
Jewell Electrical Instrument Co.	1
Jewell Radio Co.	91
Johnson Co., E. F.	88
Leeds ... Littlefuse Labs.	95
McGraw Hill Book Co.	68
M & H Sporting Goods Co.	96
Manhattan Elec. Bargain House	75
Massachusetts Radio School	80
Merit Radio Company	88
National Company	4
Ohio Carbon Co.	85
Passing the Exams	87
Pont Arthur College	87
Premier Crystal Labs.	93
<i>QST</i> Binder	Cor. II
Radio Engineering Labs.	77
Radio Supply Co.	87
Schwartz & Son, Maurice	91
Scientific Radio Service	82
Shallcross Mfg. Co.	90
Southern Products	91
Sound Engineering Corp.	76
Stern, Theodore	91
Teleplex Co.	78
Try-Mo Radio Co.	79
Uncle Dave's Radio Shack	79
United Radiobuilders	81
United Radio Mfg. Co.	89
Universal Wireless Sales Co.	72
Vibroplex Co.	90
West Side YMCA	85
Western Wireless, Ltd.	91
Weston Elec. Instrument Corp.	1



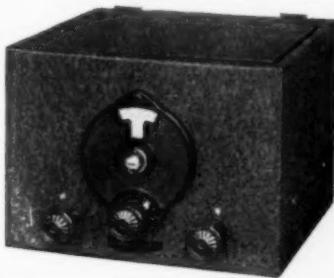
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All perfect—Look at these prices

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112A	\$.78	\$.91	230	\$1.40	\$1.65
171A48	.56	18087	1.04
199	1.28	1.39	238	1.40	1.65
201A49	.47	239	1.40	1.65
210	1.95	2.24	240 . . . . .	.79	.68
221	1.58	1.86	245 . . . . .	.57	.68
224A . . . . .	.83	.97	246 . . . . .	.80	.91
225 . . . . .	.43	.50	247 . . . . .	.50	.66
227 . . . . .	.53	.62	250	2.50	3.66
230 . . . . .	.83	.97	256 . . . . .	.56	.76
231 . . . . .	.83	.97	257 . . . . .	.57	.97
232	1.17	1.39	258 . . . . .	.58	.97
233	1.40	1.65	280 . . . . .	.53	.62
234	1.65	1.86	281	2.50	3.06
235 . . . . .	.83	.97	282 . . . . .	.65	.76
			283 . . . . .	.83	.91

ANTENNA WIRE

Solid		Stranded	
No. 14 Enam.	100'	\$.30	7/22 Enam. 100'
No. 12 Enam.	100' . . . . .	.45	7/20 Enam. 100'
No. 10 Enam.	100' . . . . .	.85	7/18 Enam. 100'

Sold in any lengths at proportionate prices

No. 18 Western Electric push back wire, 100'	50¢
50 foot length	30¢
No. 14 flexible tinned hook-up wire, with husky rubber insulation, 100'	\$1.50
100' coils, 30 strands of 34 silk-covered loop antenna wire. Extra Special per coil	29¢
Largest stock of enamel S.C.C.—D.C.C.—S.S.C. and D.S.C. in $\frac{1}{4}$, $\frac{1}{2}$ and 1 lb. spools.	

Quotations given by return mail

COPPER TUBING

$\frac{1}{8}$ "	3/16"	$\frac{1}{4}$ "	5/16"
$\frac{3}{8}$ ft.	4c ft.	$\frac{5}{8}$ ft.	6c ft.
Inside Dia.	3/16"	$\frac{1}{4}$ "	5/16"
$\frac{1}{8}$ "	7c turn	8c turn	12c turn
$\frac{3}{8}$ "	7c turn	8c turn	12c turn
3"	10c turn	12c turn	14c turn

Christell Acoustic Condenser Microphones

These units will enable you to put your phone in the "broadcast quality" class at a remarkably low figure. Complete kit of parts for condenser head \$2.95 Condenser head tested and guaranteed \$7.95 Condenser head with two stage resistance coupled amplifier, complete in shielded box, tested and guaranteed \$19.75

HARDWICK HINDLE

answers the bleeder resistor and grid leak problems once for all. See our October adv., page 6—gives you a list for reference on your resistor problems.

Answers to your questions on resistor problems.

Everything You Need to Make the Single-Signal Superhet. Described in Aug. & Sept. QST

**Price List Single-Signal Superheterodyne as described in
QST for August 1932**

1	Aluminum cabinet (knocked down) including brass rod, screws, drill, tap and hinges. All parts cut to fit but not drilled or tapped.	\$6.71
2	IRC 1-watt 250,000-ohm resistors.....	.36
1	IRC 1-watt 300-ohm resistor.....	.18
2	IRC 1-watt 5000-ohm resistors.....	.36
1	IRC 1-watt 50,000-ohm resistor.....	.18
2	IRC 1-watt 100,000-ohm resistor.....	.36
1	Electrad RI 232, 2000-ohm potentiometer.....	.55
1	National Oscillator coil assembly wound with switch and extension shafting.....	4.50
1	Set of (2 coils) 20-meter band spread coils.....	3.83
1	Set of (2 coils) 40-meter band spread coils.....	3.83
1	Set of (2 coils) 80-meter band spread coils.....	3.83
1	525 KC Biley crystal.....	6.00
1	Special air gap holder for above crystal.....	3.00
1	Sickles 525 KC I.F. filter transformer and shield.....	3.00
1	Vaxley 33B tap switch with knob.....	.39
1	Hammarlund padding condenser MICS 70.....	.42
2	National Type 58 tube shields.....	.48
1	National Type 24 tube shield.....	.24
2	National Isolantite coil sockets, 6 prong.....	.72
2	National flexible insulated couplings.....	.66
2	National RF chokes, type 100.....	.90
1	Hammarlund shielded polarized choke SPC.....	.88
15	ft. heavy filament hook-up wire, flexible.....	.15
50	ft. regular push back hook-up wire.....	.45
1	ft. 1/4" bakelite extension shafting.....	.36
2	dozen 6, 32 round head brass machine screws.....	.16
2	National 6-prong Isolantite tube sockets.....	.72
1	National 5-prong Isolantite tube socket.....	.36
3	National screen grid clips.....	.18
2	National 270 degree type "B" dials.....	2.94
10	ft. Shielded No. 18 wire.....	.12
1	National type STE 60 condenser.....	2.06
1	National type 2 SE 100 tuning condenser.....	3.82
1	Hammarlund type MCD140M dual condenser.....	2.83
13	Aerovox .01 type 1450 mica condensers.....	5.85
1	Aerovox .00025MFD type 1450 mica condenser.....	.18
1	Hammarlund MC200M tuning condenser.....	1.65
1	National type SEU 20.....	2.06

Total Cost of Complete Kit \$65.00

Price List I. F. and Audio Amplifier Single Signal Super described in September 1932 QST

1	Alum. base panel 16 x 10 x 1/8 (bent).....	\$2.70
1	Alum. Box 3 1/2 x 7 x 5 1/2 x 1/16 (bent).....	2.00
1	IRC 100,000 Ohm 1-watt resistor.....	.18
1	Electrad RI 232 2000-ohm potentiometer.....	.55
2	IRC 300 ohm 1-watt resistors.....	.36
2	IRC 5000 ohm 1-watt resistors.....	.36
2	IRC 250,000 ohm 1-watt resistors.....	.36
1	IRC 50,000 ohm 1-watt resistor.....	.18
1	IRC 100,000 ohm 1-watt resistor.....	.18
1	IRC 500,000 ohm 1-watt resistor.....	.18
1	Electrad R 1208, 250,000-ohm potentiometer.....	.55
1	Electrad R 1203, 500,000-ohm potentiometer.....	.55
1	IRC 1500 ohm 1-watt resistor.....	.18
1	Yaxley 20-ohm center tapped resistor.....	.15
2	525 KC IF transformers and shields.....	2.94
1	Thordarson R 400 Audio transformer.....	2.94
1	Thordarson Output transformer.....	2.94
2	Hammarlund SPC RF chokes.....	1.96
1	Hammarlund RFC 85 RF chokes.....	1.18
1	Toggle switch SPST.....	.23
1	Vaxley 702 Jack.....	.33
2	National type T58 tube shields.....	.46
2	National type 24 tube shields.....	.46
1	Beat frequency Osc. coil and shield.....	1.77
3	National Isolantite 5-prong tube sockets.....	1.08
2	National Isolantite 6-prong tube sockets.....	.72
10	feet shield wire.....	.12
50	feet push back hook-up wire.....	.45
11	Aerovox .01 mica condensers.....	4.95
3	Flechtheim 1 mfd 250-volt paper cond.....	1.47
1	SM 276 RF choke.....	.45
2	Aerovox .00025 mfd mica condensers.....	.54
1	Aerovox .01 mfd tone control condenser.....	.45
1	Hammarlund MICS 1000 padding condenser.....	.89
1	small 250 MMF mica condenser.....	.09
1	Hammarlund MC50S condenser.....	1.06
1	Weston type 506 0 to 1 MA.....	5.74
1	I. F. transformer, Sickles type.....	1.75
1	I. F. Filter transformer, Sickles type.....	1.00
1	Second detector, I. F. transformer.....	1.75
1	Heterodyne filter with condensers.....	1.50

Total Cost of Complete Kit \$45.00

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New, 1933 Catalog Just off the Press. Write for Your Copy. Contains All that's New in High Frequency and Laboratory Apparatus

36 Years
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Service

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GOODS CO.
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